Acer Altos G300 Series

User's guide

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Acer Altos G300 Series
User's guide

December 2002

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Record the model number, serial number, purchase date, and place of purchase information in the space provided below. The serial number and model number are recorded on the label affixed to your computer. All correspondense concerning your unit should include the serial number, model number, and purchase information.

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Notices

FCC notice

This device has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the device and receiver
- Connect the device into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/television technician for help

Notice: Shield cables

All connections to other computing devices must be made using shielded cables to maintain compliance with FCC regulations.

Notice: Peripheral devices

Only peripherals (input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this equipment. Operation with noncertified peripherals is likely to result in interference to radio and TV reception.

Caution! Changes or modifications not expressly approved by the manufacturer could void the user's authority, which is granted by the Federal Communications Commission, to operate this computer.

Use conditions

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This part complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Notice: Canadian users

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Remarque à l'intention des utilisateurs canadiens

Cet appareil numérique de la classe B respected toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Important safety instructions

Read these instructions carefully. Save these instructions for future reference.

1 Follow all warnings and instructions marked on the product.

2 Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

3 Do not use this product near water.

4 Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.

5 Slots and openings in the cabinet and the back or bottom are provided for ventilation; to ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register, or in a built-in installation unless proper ventilation is provided.

6 This product should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.

7 Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord.

8 If an extension cord is used with this product, make sure that the total ampere rating of the equipment plugged into the extension cord does not exceed the extension cord ampere rating. Also,

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make sure that the total rating of all products plugged into the wall outlet does not exceed the fuse rating.

9 Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

10 Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risks. Refer all servicing to qualified service personnel.

11 Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

12 When the power cord or plug is damaged or frayed

a If liquid has been spilled into the product

b If the product has been exposed to rain or water

c If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal condition.

d If the product has been dropped or the cabinet has been damaged

e If the product exhibits a distinct change in performance, indicating a need for service.

f Replace the battery with the same type as the product's battery we recommend. Use of another battery may present a risk of fire or explosion. Refer battery replacement to a qualified serviceman.

13 Warning! Batteries may explode if not handled properly. Do not disassemble or dispose of them in fire. Keep them away from children and dispose of used batteries promptly.

14 Use only the proper type of power supply cord set (provided in your accessories box) for this unit. It should be a detachable type: UL listed/CSA certified, type SPT-2, rated 7A 125V minimum, VDE approved or its equivalent. Maximum length is 15 feet (4.6 meters).

Laser compliance statement

The CD-ROM drive in this computer is a laser product. The CD-ROM drive’s classification label (shown below) is located on the drive.

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CLASS 1 LASER PRODUCT
CAUTION: INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.

APPAREIL A LASER DE CLASSE 1 PRODUIT
LASERATTENTION: RADIATION DU FAISCEAU LASER INVISIBLE EN CAS D'OUVERTURE. EVITTER TOUTE EXPOSITION AUX RAYONS.

LASER KLASSE 1
VORSICHT: UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET, NICHT DEM STRAHLL AUSSETZEN

PRODUCTO LÁSER DE LA CLASE I
ADVERTENCIA: RADIACIÓN LÁSER INVISIBLE AL SER ABIERTO. EVITE EXPONERSE A LOS RAYOS.

ADVARSEL: LASERSTRÅLING VEDÅBNING SE IKKE IND I STRÅLEN

VARO! LAVATTAESSA OLET ALTTINA LASERSÅTEILYLLE.
VARNING: LASERSTRÅLNING NÅR DENNA DEL ÅR ÖPPNAD ÅLÅ TUIJOTA SÅTEESEENSTIRRA EJ IN I STRÅLEN

VARNING: LASERSTRÅLNING NAR DENNA DEL ÅR ÖPPNADSTIRRA EJ IN I STRÅLEN

ADVARSEL: LASERSTRÅLING NAR DEKSEL ÅPNESSTIRR IKKE INN I STRÅLEN

Lithium battery statement

CAUTION
Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

ADVARSEL!
Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Léver det brugte batteri tilbage til leverandøren.

ADVARSEL
Eksplosjonsfare ved feilaktig skifte av batteri. Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten. Brukte batterier kasseres i henhold til fabrikantens instruksjoner.

VARNING
Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller

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en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera anvãnt batteri enligt fabrikantens instruktion.

VAROITUS
Päristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

VORSICHT!
Explosionsgefahr bei unsachgemäßen Austausch der Batterie Ersatz nur durch denselben oder einem vom Hersteller empfohlenem ähnlichen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

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1 Getting started

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The Acer Altos G301 is a PCI bus based single processor system loaded with a host of new and innovative features. The system offers a new standard for flexible productivity ideal for local or wide area networks and multiuser server environments.

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Overview

The Acer Altos G301 is a PCI bus based single processor system board built on an extended ATX baseboard. It comes with a single mPGA478 processor socket utilizing an Intel® Pentium® 4 processor integrated with the ServerWorks GC-SL chipset. The system board also integrates the Intel® 82540EM Gigabit Ethernet controller that supports WOL (Wake on LAN) for better remote site management.

For expandability, the system board using ATI Rage XL integrated with 8MB memory, one 32bit/33MHz 3.3V PCI bus slot, four 64bit/33MHz 3.3V PCI bus slots and four DIMM sockets that allow memory installation to a maximum of 4GB using four 1GB Registered DDR SDRAM (Synchronous DRAM) with ECC DIMMs.

For connectivity, the system board supports two USB (Universal Serial Bus) connectors, one UART NS16C550 serial ports, one enhanced parallel port with Enhanced Parallel Port (EPP)/Extended Capabilities Port (ECP) support, two PS/2 port, a diskette drive interface, three embedded hard disk interfaces, one RJ-45 network port and a 9-pin connector for video output.

The system is fully compatible with MS-DOS V6.X, Novell Netware 6.0, RedHat Linux 7.3/8.0, Windows NT 4.0 server, and Windows 2000 server.

Processor

The Pentium® 4 processor implements Intel® NetBurst™ micro architecture, Hyper-Pipelined Technology, Advanced Dynamic Execution, Enhanced Floating-Point and Multimedia Unit, Streaming SIMD Extensions 2 (SSE2) Instructions. Based on Intel® NetBurst™ micro architecture, the Pentium 4 processor offers higher-performance processing than ever before. Built with Intel's 0.13-micron technology, the Pentium 4 processor delivers significant performance gains for use in home computing, business solutions and all your processing needs.

This system board supports 400/533MHz system bus frequencies for one Pentium 4 processor supporting frequencies start at 1.8GHz.

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Memory

The four DIMM sockets on board allow memory upgrade to a maximum of 4GB using four 1-GB DDR SDRAM (Synchronous DRAM) DIMMs. For data integrity, the default setting of the ECC (error-correcting code) function of the memory system in BIOS is enabled.

The system board supports DDR266 SDRAMs; PC-133, PC-100, PC-66 MHz SDRAMs are not supported.

System chipsets

ServerWorks GC-SL chipset

The ServerWorks GC-SL+SL chipset was specifically designed to meet the needs of high performance systems. It consists of two components: SeverWorks CMIC-SL (North bridge) and ServerWorks CSB6 (South bridge).

- ServerWorks CMIC-SL(North bridge) supports Intel® Pentium® 4 CPU with mPGA478 package. Build-in features include main memory interface with optimized support for DDR SDRAM, 64-bit, 33MHz primary PCI bus interface (PCI) with integrated PCI arbiter, I2C bus support and other related functions.
- ServerWorks CSB6 (South bridge) integrates support for ACPI, USB 1.1, SMBus, PCI master, PCI arbiter, LPC bus controller, LPC arbiter, seven channel 8237 compatible DMA controller and DMA 66/100 on primary & secondary IDE with DMA66 on third IDE and other standard PC functions.

LAN subsystem

Another cost-effective feature for network solution is the integration of Intel® 82540EM Gigabit Ethernet controller which supports Advanced Configuration and Power Interface (ACPI) 2.0 based power management, advanced System Management Bus (SMBus) based manageability, Wired for Management (WfM) 2.0 compliance, TCP/UDP/IP checksum calculation and segmentation, PCI 2.2 compliance, and PC 2001 compliance.

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Expansion slots

PCI bus

The system board has one PCI buses that support 32-bit/33 MHz/5V PCI devices and four PCI buses supporting 64-bit/33 MHz/3.3V PCI devices.

Hardware management support

The system board supports the power-management function that conforms to the power-saving standards of the U.S. Environmental Protection Agency (EPA) Energy Star program. It also offers Plug-and-Play. This feature saves the user from configuration troubles, thus making the system more user-friendly.

Additional features include hardware support for ASM (Advanced Server Management). ASM detects CPU thermal condition problems, CPU working voltage detection (±12V/±5V/3.3V/1.5V), and PCI bus utilization calculation. It also detects if the CPU fan or the chassis fan malfunctions.

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Features summary

The main board has the following major components:

- Utilizes a mPG478 processor socket that supports a Pentium 4 processor running start at 1.8 GHz and future generations of Pentium CPUs
- ServerWorks GC-SL chipset which includes the north and the south bridge
- Onboard Gigabit Ethernet chip that supports WOL and AOL
- Four DIMM sockets that accept 128-, 256-, 512-, and 1-GB DDR SDRAMs with a maximum memory upgrade of 4-GB
- On-board ATI Rage XL and 5 PCI bus slots with 4 supporting 64-bit PCI
- System clock/calendar with battery backup
- IDE hard disk and diskette drive interfaces
- Auxiliary power connector for 300W SPS and ATX power supply
- Advanced Server Management (ASM)
- External ports:
  - 2 USB connectors
  - PS/2-compatible keyboard port
  - PS/2-compatible mouse port
  - RJ-45 jack
  - Parallel port
  - Serial port

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Preinstallation requirements

Selecting a site

Before unpacking and installing the system, select a suitable site for the system for maximum efficiency. Consider the following factors when choosing a site for the system:

- Near a grounded power outlet
- Clean and dust-free
- Sturdy surface free from vibration
- Well-ventilated and away from sources of heat
- Secluded from electromagnetic fields produced by electrical devices such as air-conditioners, radio and TV transmitters, etc.

Checking the package contents

Check the following items from the package:

- Acer Altos G300 (Model: G301) system
- Acer Altos G300 Series user's guide
- EasyBUILD CD
- Acer Altos G300 Series accessory box
- System keys (hung inside the front panel door)

If any of the above items are damaged or missing, contact your dealer immediately.

Save the boxes and packing materials for future use.

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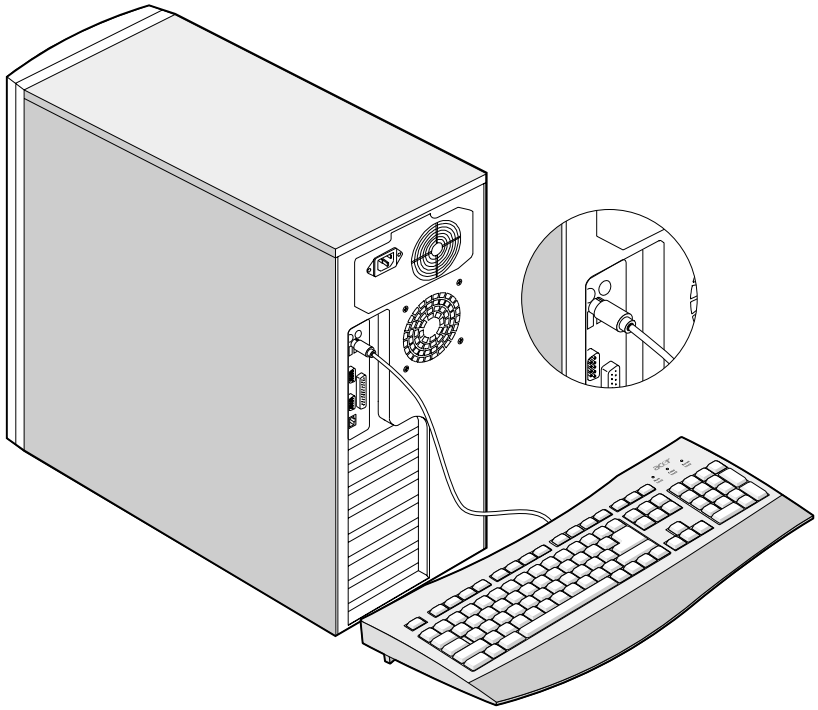
Basic connections

The system unit, keyboard, mouse, and monitor constitute the basic system. Before connecting any other peripherals, connect these peripherals first to test if the system is running properly.

Connecting the keyboard



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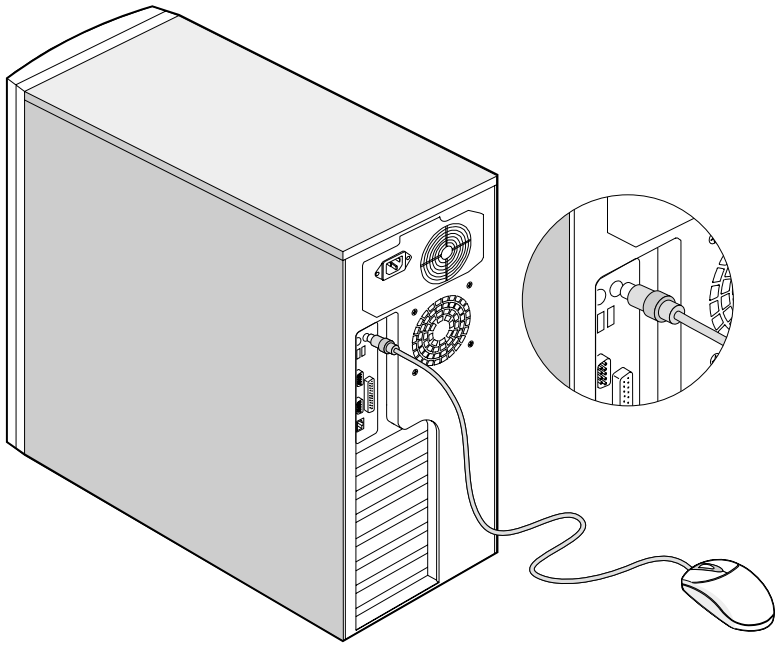
Connecting the mouse



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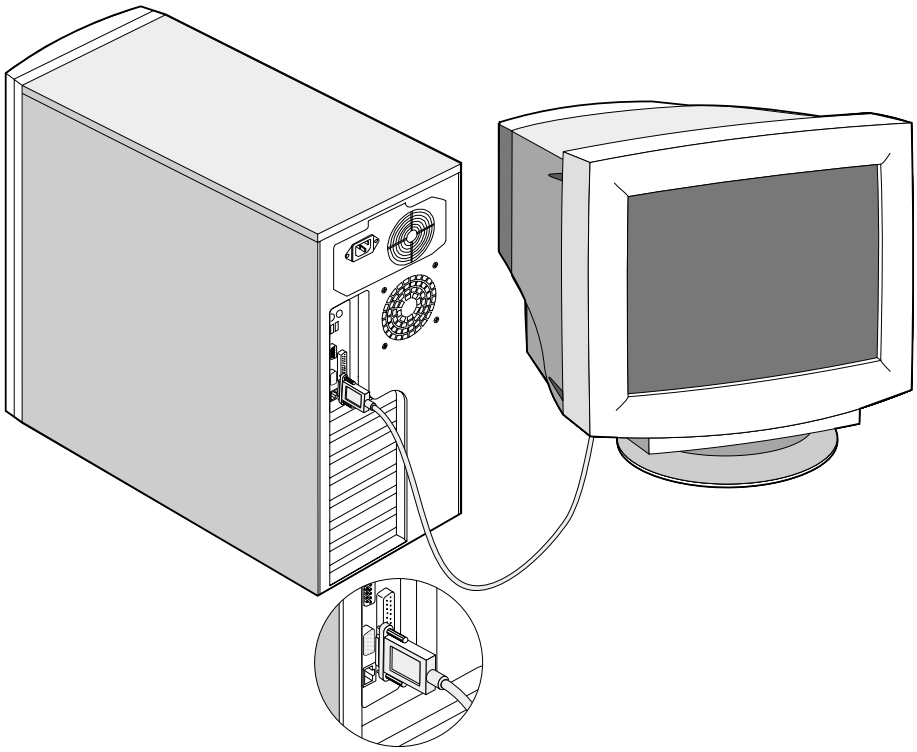
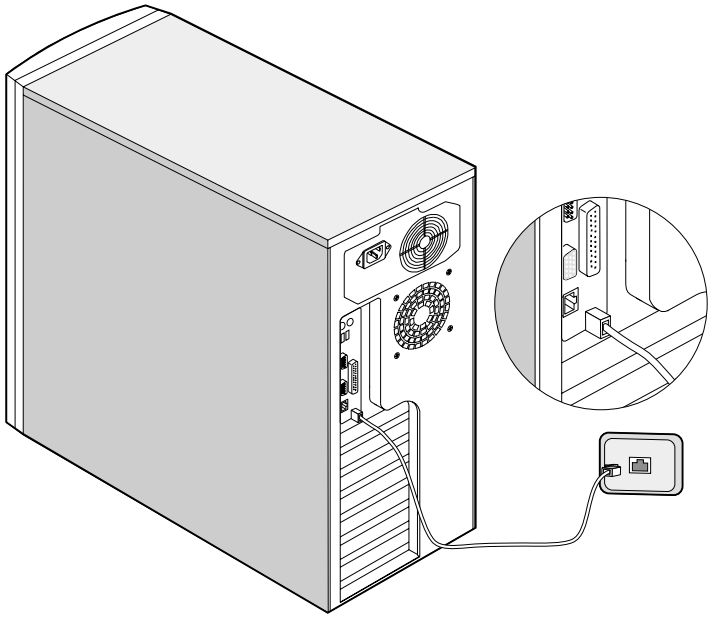
Connecting the VGA monitor



Connecting to the network



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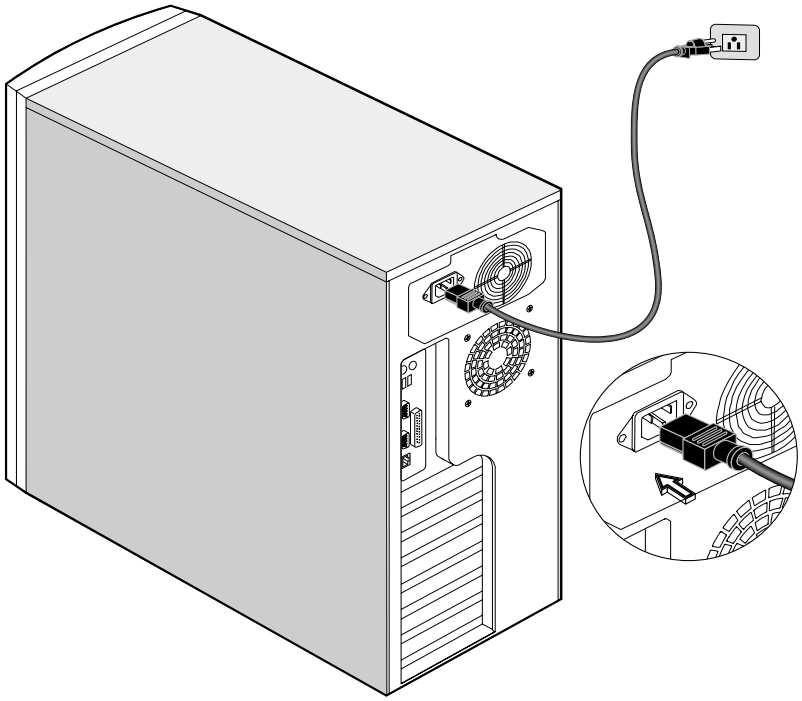
Connecting the power cable



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System startup

After making sure that you have set up the system properly and connected all the required cables, you may now apply power to the system.

To power on the system:

Open the front panel door and press the power button. The system starts up and displays a welcome message. After that, a series of power-on self-test (POST) messages appears. The POST messages indicate if the system is running well or not.

Note: If the system does not turn on or boot after pressing the power button, go to the next section for the possible causes of the boot failure.

Aside from the self-test messages, you can determine if the system is in good condition by checking if the following occurred:

- Power indicator LED on the front bezel lights up (green)
- Power, Num Lock, and Caps Lock LED indicators on the keyboard light up

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Power-on problems

If the system does not boot after you have applied power, check the following factors that might have caused the boot failure.

- The external power cable may be loosely connected.

  Check the power cable connection from the power source to the power socket on the rear panel. Make sure that each cable is properly connected to each power supply.

- No power comes from the grounded power outlet.

  Have an electrician check your power outlet.

- Loose or improperly connected internal power cables.

  Check the internal cable connections. If you are not confident to perform this step, ask a qualified technician to help you.

Warning! Make sure all power cords are disconnected from the electrical outlet before performing this task.

Note: If you have gone through the preceding actions and the system still fails to boot, ask your dealer or a qualified technician for assistance.

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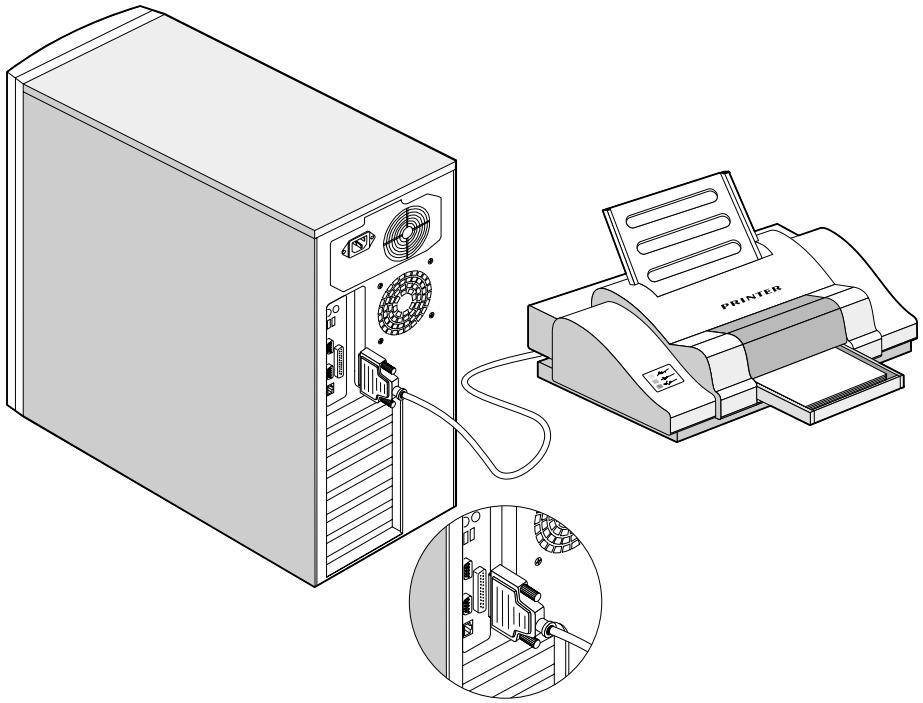
Connecting options

Printer

To connect a printer, plug the printer cable into the parallel port located on the rear panel of your computer.



USB devices

Universal Serial Bus (USB) is a new serial bus design that is capable of cascading low-/medium-speed peripherals (less than 12 Mbps) such as a keyboard, mouse, joystick, scanner, printer and modem. With USB, complex cable connections can be eliminated.

Your computer comes with two USB ports. These ports allow you to connect additional serial devices to your computer without using up its system resources.

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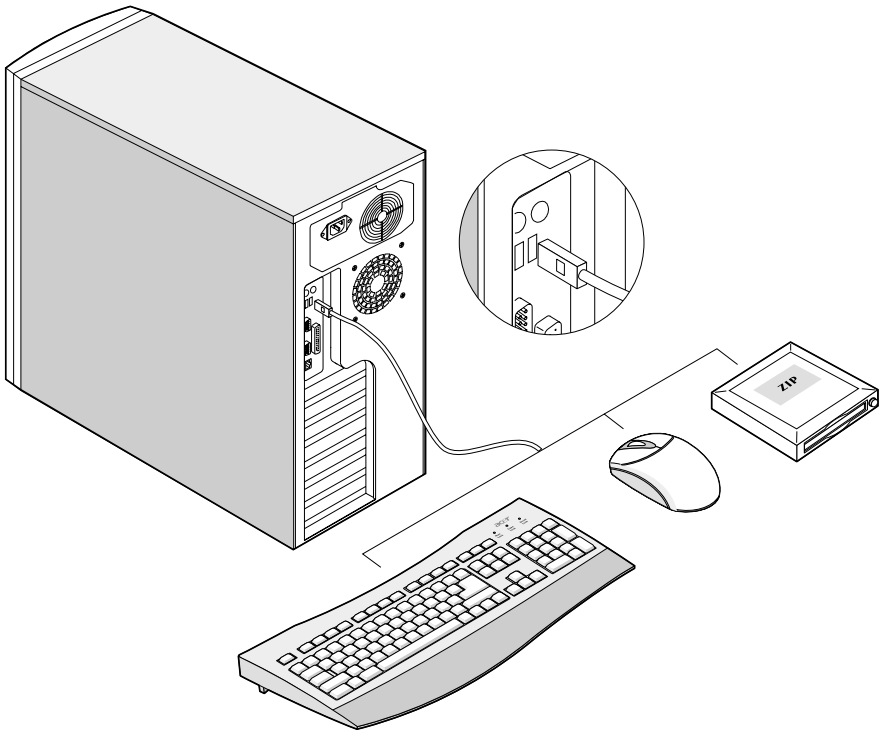
To connect a USB device, simply plug the device cable into any of the USB ports.



Note: Most USB devices have a built-in USB port which allows you to daisy-chain other devices.

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Tower-to-rack option

Aside from its tower configuration, the Acer Altos G300 (model G301) server can also be mounted in a rack-model position. A rack mount kit is available for customers who want to convert a tower-mounted system to a rack-model design.

Please refer to Appendix C to this manual for installing the optional rack mount kit.

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2 System tour

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This chapter discusses the features and components of your computer.

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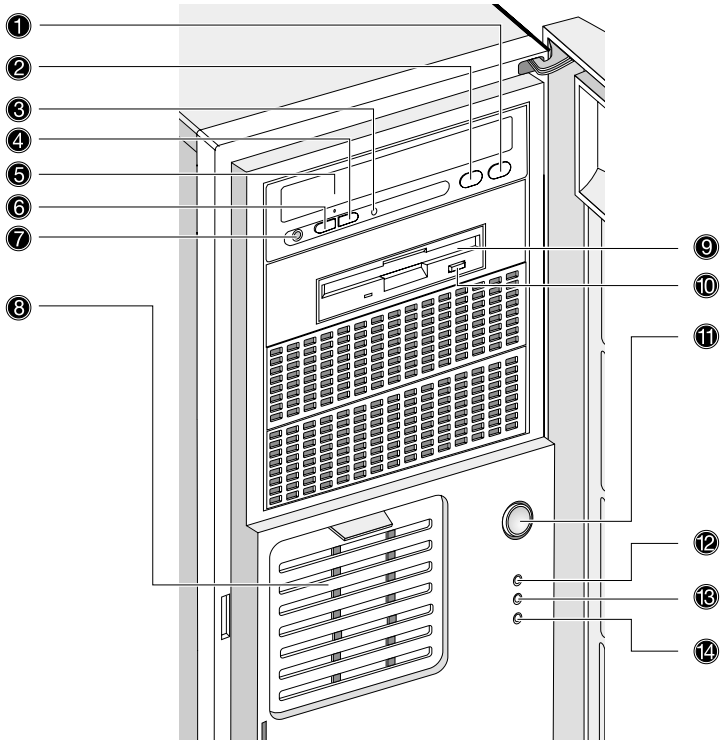
External and internal structure

Front panel



No.	Description
1	CD-ROM drive stop/eject button
2	CD-ROM drive play/forward button
3	CD-ROM drive LED
4 and 6	CD-ROM volume control
5	CD-ROM drive tray
7	CD-ROM drive earphone socket
8	Altos EasyStor Cage (Removable HDD tray)
9	Floppy disk drive tray

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No.	Description
10	Floppy disk drive eject button
11	Power button
12	System power LED
13	Hard disk access LED
14	Warning LED

Note: The positions and features of items (1) - (7) above may differ depending on the optical drive module installed

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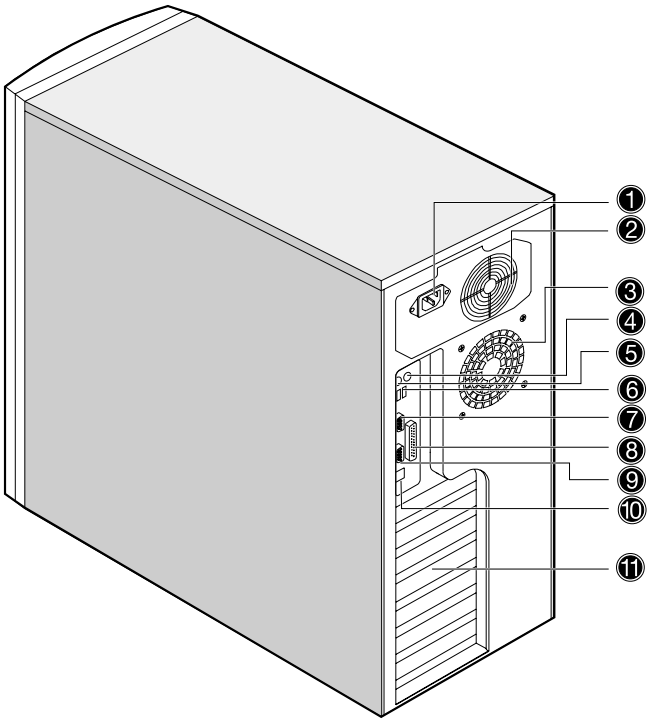
Rear panel



No.	Description
1	Power cable socket
2	Power Supply Fan
3	System fan
4	PS/2 mouse port
5	PS/2 keyboard port
6	USB ports
7	Serial port
8	Parallel port
9	VGA port
10	LAN port
11	PCI expansion card slots

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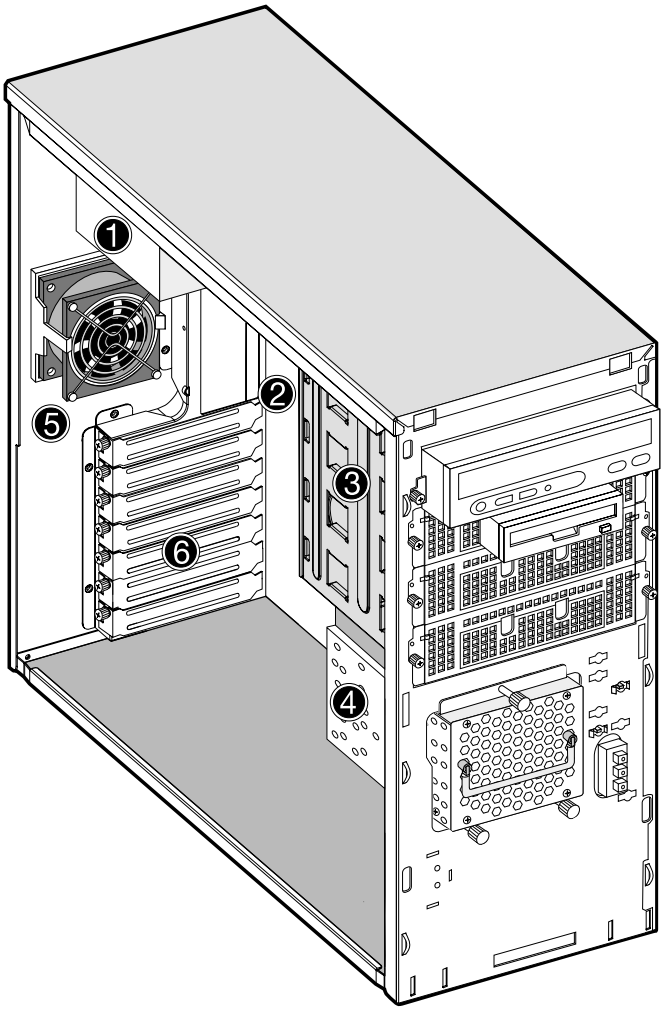
Internal components



No.	Description
1	Power supply
2	System board
3	5.25-inch drive bays
4	Altos EasyStor Cage (Removable HDD tray)
5	System fan
6	PCI expansion card slots

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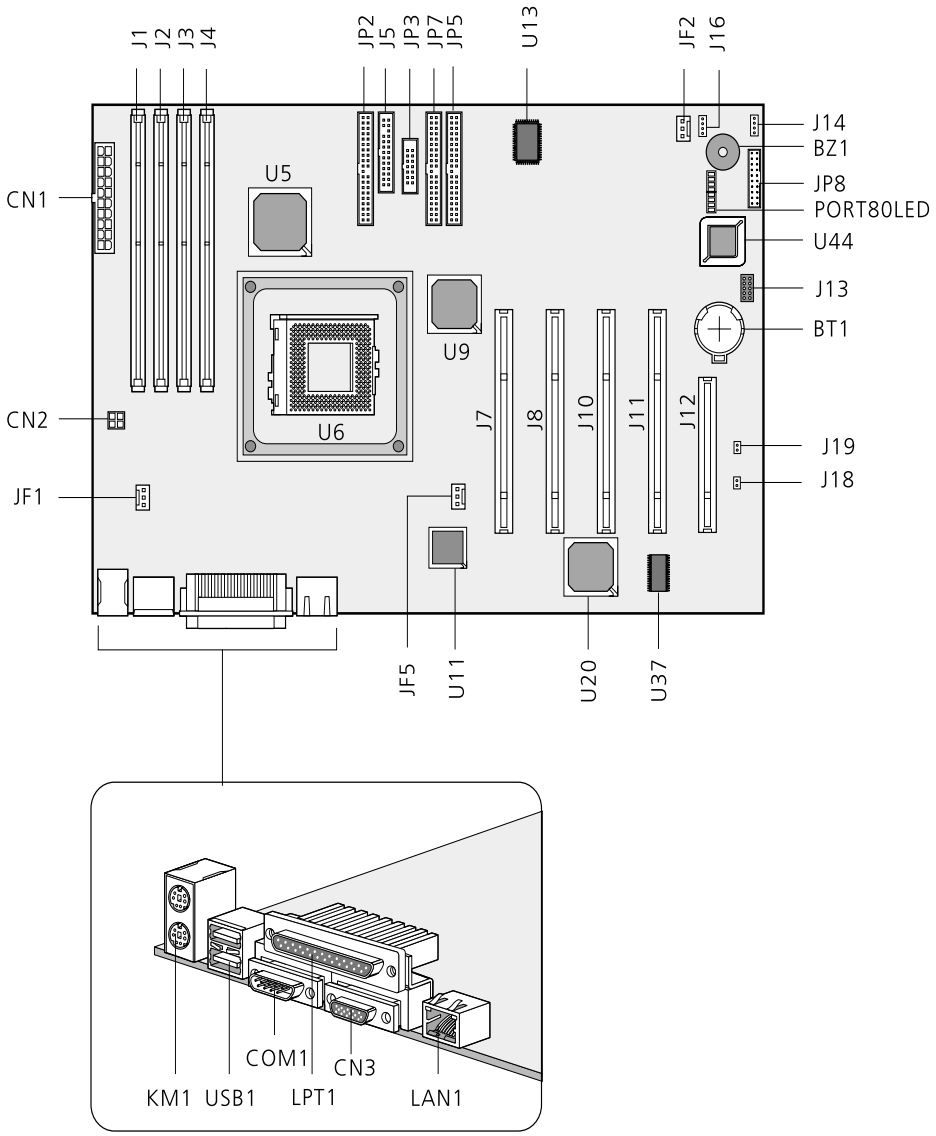
System board layout



Item	Description
KM1	PS/2 Keyboard & PS/2 Mouse
USB1	USB Connectors
COM1	Serial Port
CN3	VGA Port

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Item	Description
LPT1	Parallel Port
LAN1	RJ45 LAN Port
U11	Intel® 82540EM Gigabit Ethernet Controller
U20	ATI RageXL
CN2	Power Connector (4-pin)
CN1	Power Connector (20-pin)
JF1	Rear System Fan
JF2	EasyStor cage Front Fan
JF5	CPU FAN
J1	DDR DIMM A
J2	DDR DIMM B
J3	DDR DIMM C
J4	DDR DIMM D
U6	P4 CPU Socket 478
U5	North Bridge (CMIC-SL)
U9	South Bridge (CSB6)
JP2	Third IDE Channel
J5	Floppy Connector
JP3	Control Panel
JP7	Primary IDE Connector
JP5	Secondary IDE Connector
J7	64-bit/33MHz/3.3V PCI Slot 5

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Item	Description
J8	64-bit/33MHz/3.3V PCI Slot 4
J10	64-bit/33MHz/3.3V PCI Slot 3
J11	64-bit/33MHz/3.3V PCI Slot 2
J12	32-bit/33MHz/5V PCI Slot 1
J13	Jumper Setting
J18	Power Connector
J19	Reset Connector
J16	SCSI HDD Access LED Indicator
JP8	Feature Connector
J14	I^2C Connector
U44	BIOS
BT1	Battery
BZ1	Buzzer
Port80LED	Diagnostics LED

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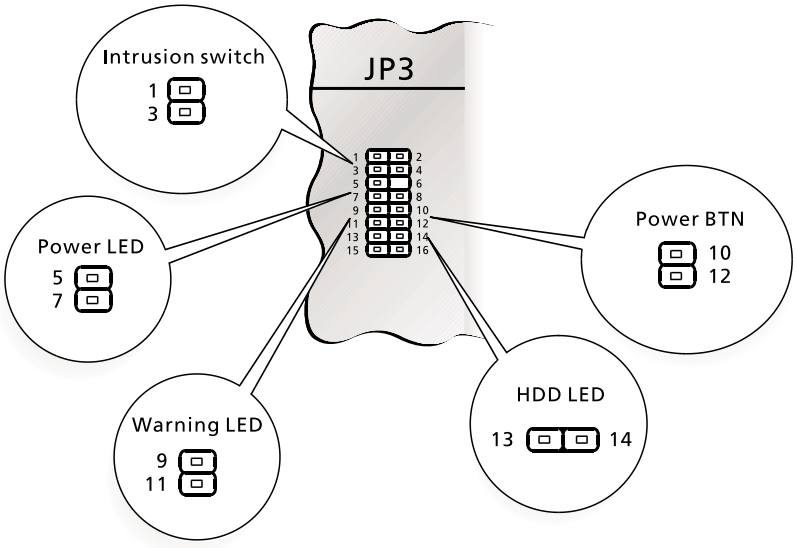
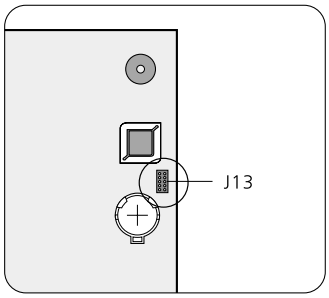
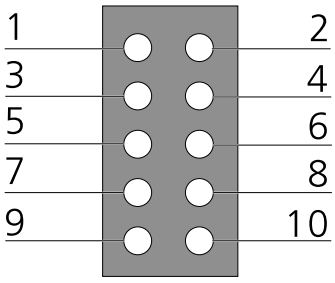
Control Panel (JP3)



Jumper Setting (J13)





	Function	Default setting
PIN 1-2	Clear password	ON

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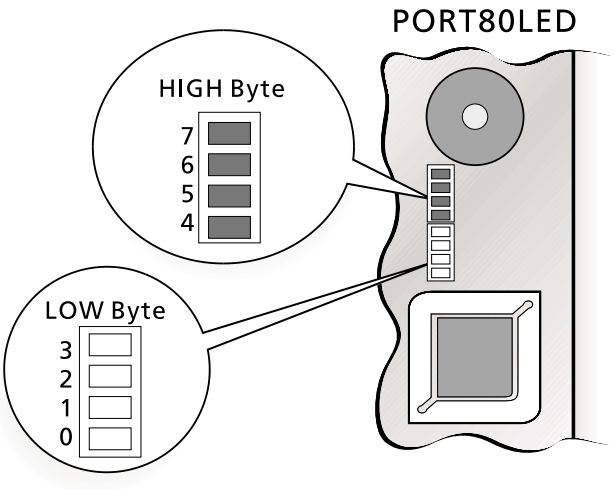
	Function	Default setting
PIN 3-4	Clear NVRAM	OFF
PIN 5-6	Recover BIOS ROM	OFF

Diagnostics LED (Port80LED)



Note: Diagnostics LED show POST checkpoint codes when BIOS performs the Power On Self Test. See page 122.

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3 Upgrading your system

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This chapter contains instructions on how to upgrade your computer.

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Installation precautions

Before you install any system component, we recommend that you read the following sections. These sections contain important ESD precautions along with preinstallation and post-installation instructions.

ESD precautions

Electrostatic discharge (ESD) can damage your processor, disk drives, expansion boards, and other components. Always observe the following precautions before you install a computer component:

1 Do not remove a component from its protective packaging until you are ready to install it.

2 Wear a wrist grounding strap and attach it to a metal part of the computer before handling components. If a wrist strap is not available, maintain contact with the computer throughout any procedure requiring ESD protection.

Preinstallation instructions

Always observe the following before you install any component:

1 Turn off your system and all the peripherals connected to it before opening it. Then unplug all cables from the power outlets.

2 Open your computer according to the instructions on page 33.

3 Follow the ESD precautions described above before handling a computer component.

4 Remove any expansion boards or peripherals that block access to the DIMM sockets or component connector.

5 See the following sections for specific instructions on the component you wish to install.

Warning! Not turning off the computer properly before you start installing the components may cause serious damage.
Do not attempt the procedures described in the following sections unless you are a qualified service technician.

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Post-installation instructions

Observe the following after installing a computer component:

1 See to it that the components are installed according to the step-by-step instructions in their respective sections.

2 Replace any expansion boards or peripherals that you removed earlier.

3 Replace the computer cover.

4 Connect the necessary cables and turn on your computer.

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Opening your system

Caution: Before you proceed, make sure that you have turned off your computer and all peripherals connected to it. Read the “Preinstallation instructions” on page 31.

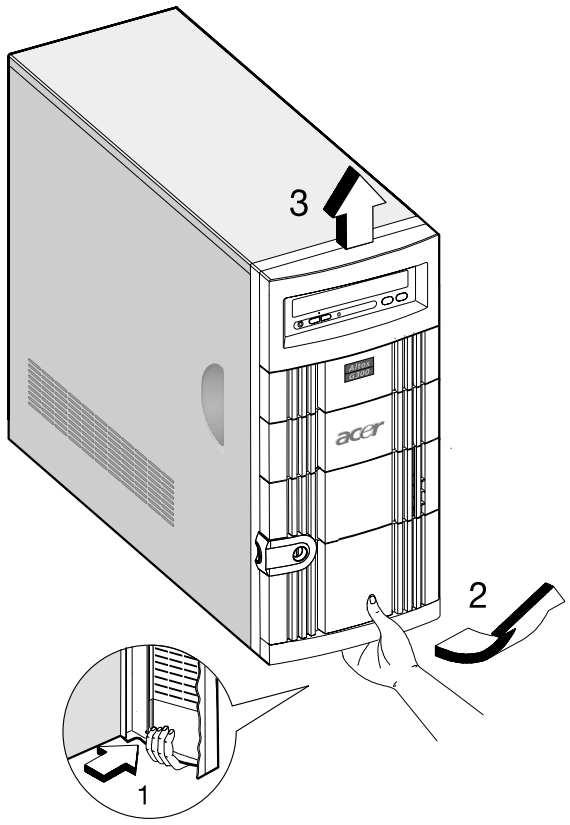
You need to open your computer before you can install additional components. See the following section for instructions.

Removing the front panel

1 Unlock the door lock.

2 Insert your hand in the opening under the front panel. Reach for the panel handle and press it to release the cover from the housing frame.

3 Pull the cover to detach it completely from the frame.



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Removing the side panels

The system housing has one front panel and two removable side panels. Always observe the following ESD (electrostatic discharge) precautions before installing any system component:

1 Do not remove any system component from its packaging unless you are ready to install it.

2 Wear a wrist grounding strap before handling electronic components. Wrist grounding straps are available at most electronic component stores.

Danger! DO NOT attempt the procedures in the following sections unless you are confident of your capability to perform them. Otherwise, ask a service technician for assistance.

A microswitch is allocated on the right side of the front chassis. It helps indicate whether the panel is removed or intact. Also, a security lock secures the front panel to protect against unauthorized access.

To remove the side panels:

1 Turn off the power to the system unit and unplug all cables.

2 Place the system unit on a flat, steady surface.

3 Remove the front panel. See page 33.

4 Remove the one front screw with a Phillips screwdriver to remove one side panel. Keep them in a safe place for later use.

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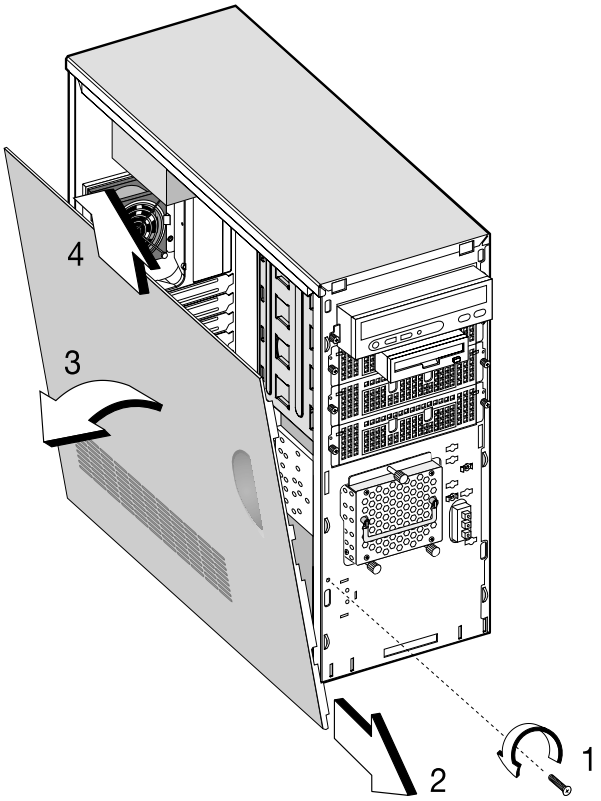
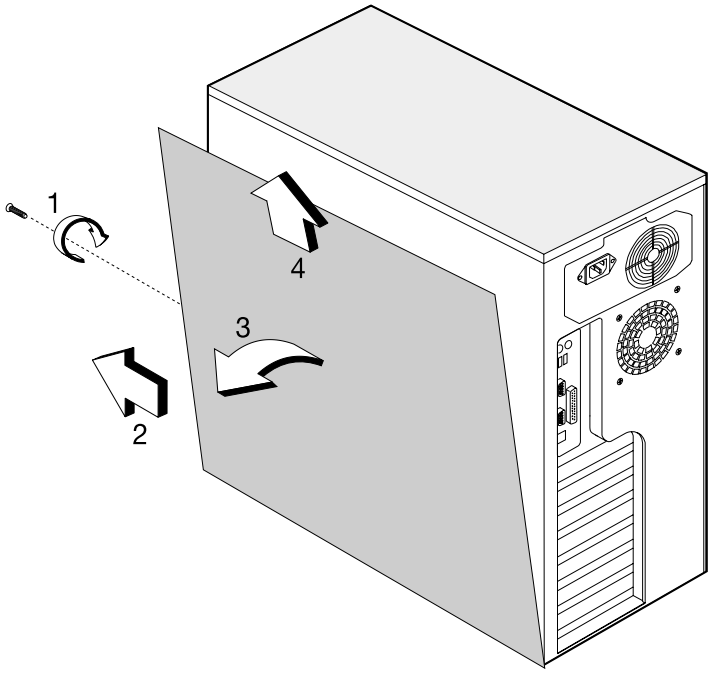
5 Detach the side panel.



6 Repeat steps 4 to 5 to remove the other side panel.



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Installing and removing storage devices

The housing supports four 5.25-inch, and three internal 3.5-inch storage devices. The empty drive bays allow you to install additional drives such as a CD-ROM drive, digital audio tape (DAT) drive or another hard disk drive.

Note: Your basic system comes with a CD-ROM drive, a 3.5-inch diskette drive, and a hard disk drive already installed.

Replacing a 3.5-inch or a 5.25-inch storage device

To replace a 3.5-inch storage device:

1 Open the front panel door and pull down the door of the Altos EasyStor Cage.

2 Remove the thumb screws from the Altos EasyStor Cage.

3 Pull out the Altos EasyStor Cage.

4 Disconnect the power cable of the hard disk fan.

5 Disconnect the power and signal cable from the old drive.

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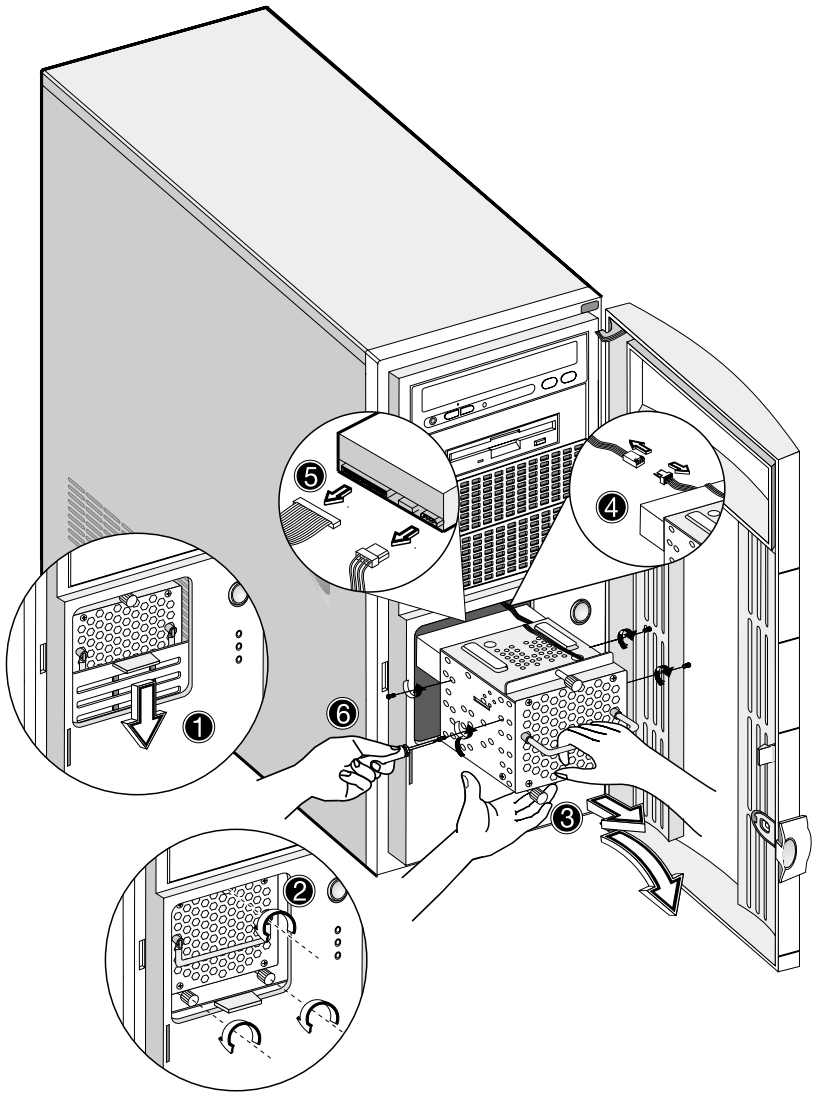
6 Remove the four screws with a Phillips screw driver and remove the old drive from the 3.5-inch hard disk tray.



Note 1: Pull down the door of the EasyStor Cage till it clicks into place.

Note 2: Pull it out in horizontal position. EasyStor Cage will become heavy when containing more than 2 hard disks. Remember pull it out carefully with both hands for its heavy weight.

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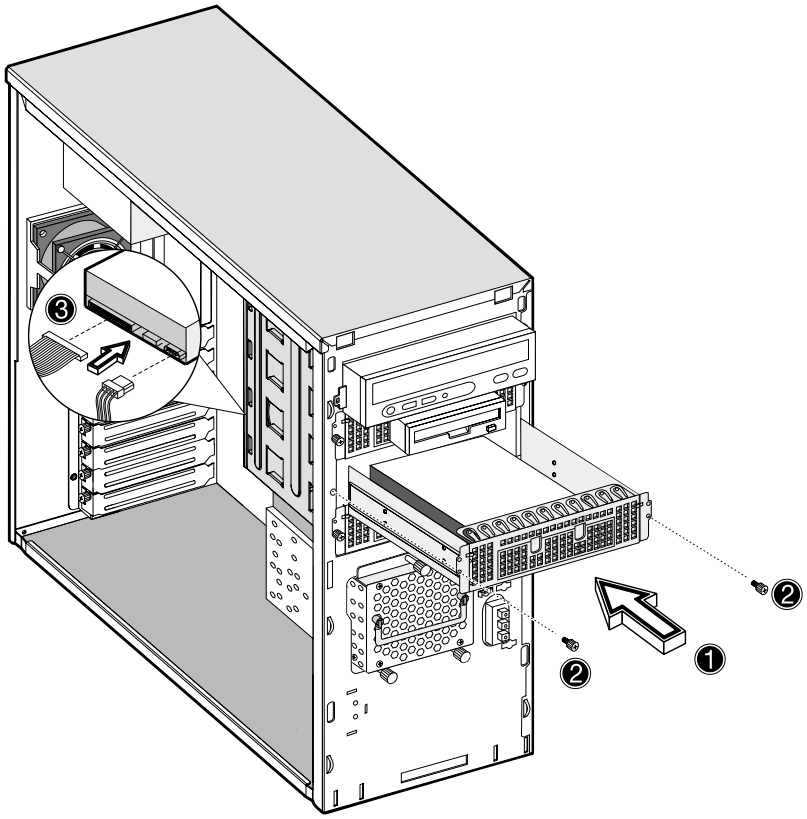
Installing a hard disk

To install a hard disk drive into the hard disk frame:

1 Insert the drive tray.

2 Secure the drive tray with two screws.

3 Connect the power and signal cables.



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Installing a DLT

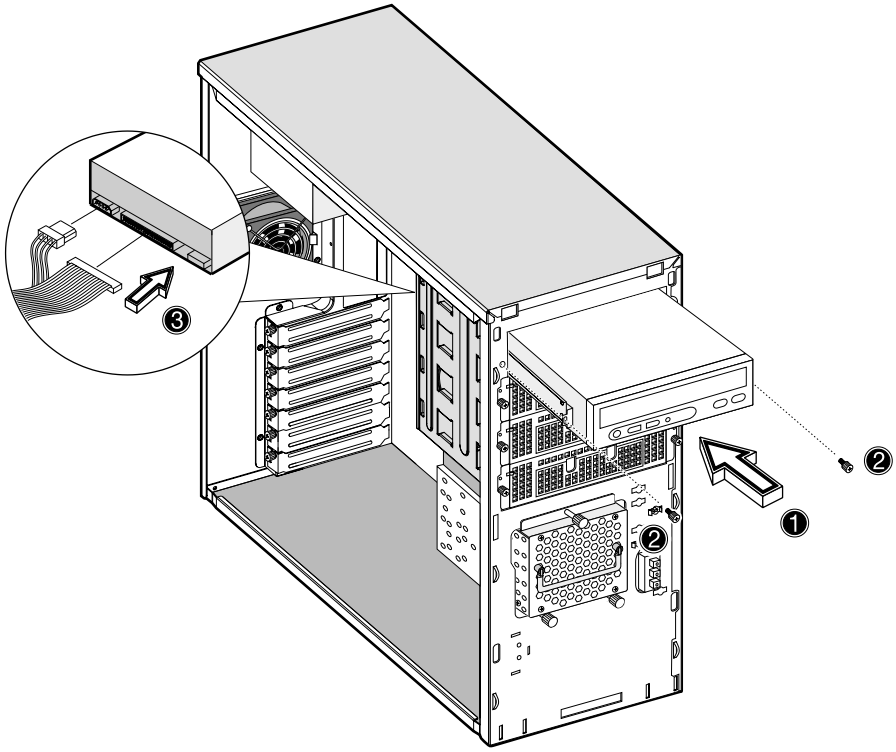
To install a DLT drive into the 5.25-drive frame.

1 Insert the DLT.

2 Secure the DLT with two screws.

3 Connect the power and signal cables.

Note: DLT drive should be installed in the 1st or 2nd 5.25-inch drive tray.



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Installing and removing the CPU

The Pentium 4 comes in a mPGA478 package. The mPGA478 package is designed for the new breed of sleek, high performance, small form factor PCs.

The system board supports a Pentium 4 processor running start at 1.8 GHz and future generations of Pentium CPUs.

Caution: Always observe the ESD precautions when installing or removing a system component. Refer to page 31.

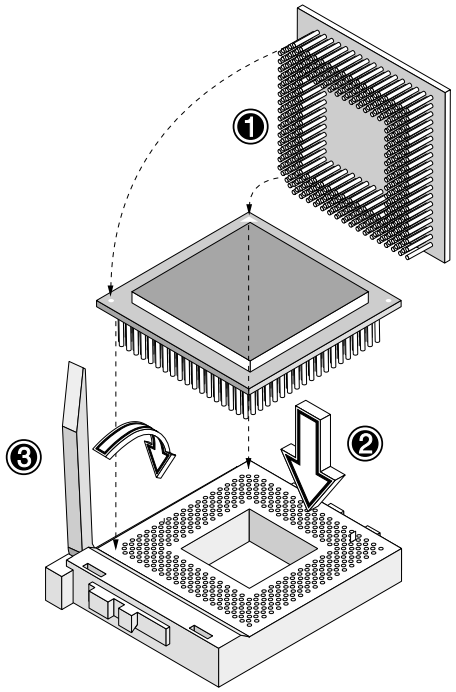
Installing a CPU

Follow these steps to install a CPU:

1 Remove the processor from its protective packaging.

2 Insert the new CPU into the CPU socket. Make sure that pin 1 (indicated by a notched corner) of the CPU connects to hole 1 of the socket.

Push down the socket lever to lock the new CPU into the socket.



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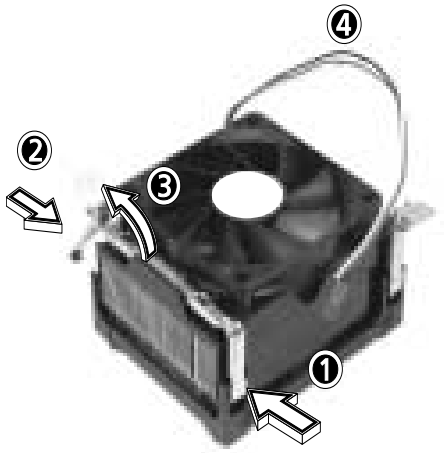
3 Attach one side of the fan/heatsink metal bracket to the CPU socket and then gently push down the other side of the metal bracket until it locks in place.



4 Connect the 3-pin fan/thermal cable to the system board. Refer to section "System board layout" on page 23 for the location of the fan/thermal connectors.

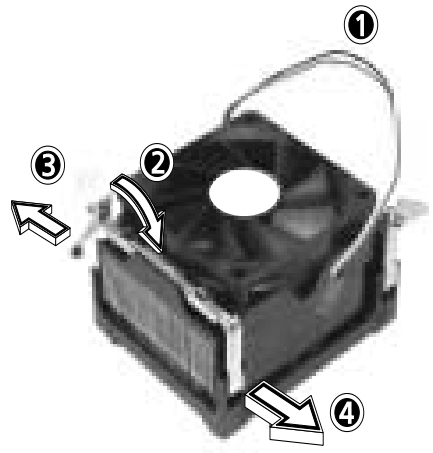
Note: The heatsink becomes very hot when the system is on. NEVER touch the heatsink with any metal or with your hands.

Removing a CPU

Follow these steps to remove a CPU:

1 Disconnect the 3-pin fan/heatsink cables from the system board.

2 Unhook one side of the fan/heatsink metal bracket and gently lift it before removing the other side.



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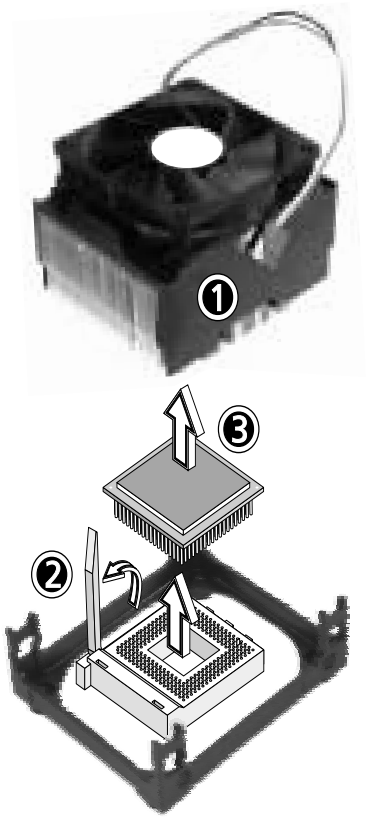
3 Gently push the socket lever down to release the lever and then pull it up.



4 Remove the CPU.

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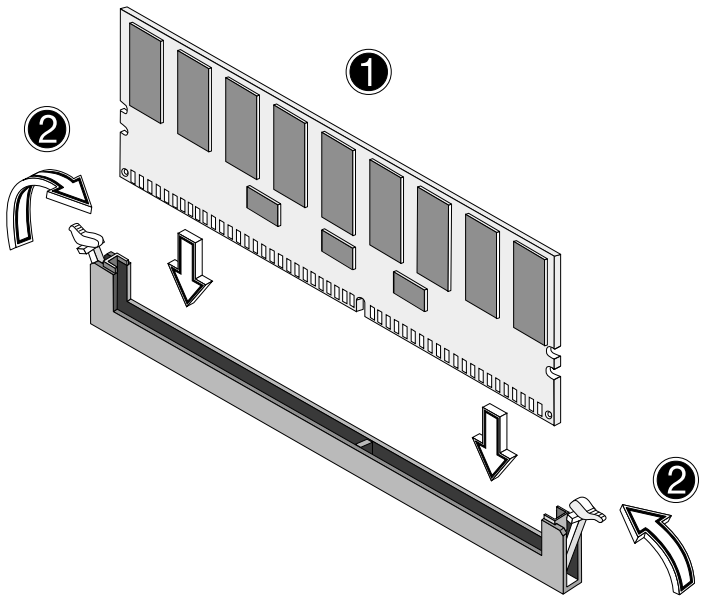
Installing and removing memory modules

The four 184-pin sockets onboard support DDR SDRAM-type DIMMs. You may install 128-MB, 256-MB, 512-MB, or 1-GB DIMMs for a maximum of 4-GB system memory.

This system board supports DDR266 266MHz SDRAM.

Each of the DIMM socket is independent from the others. This independence allows you to install DIMMs with different capacities to form different configurations.

To install a DIMM, align it to an empty slot and press it in until the holding clips secure the DIMM in place.



Note: The DIMM socket is slotted to ensure proper installation. If you slip in a DIMM but it does not completely fit, you may have inserted it the wrong way. Reverse the orientation of the DIMM.

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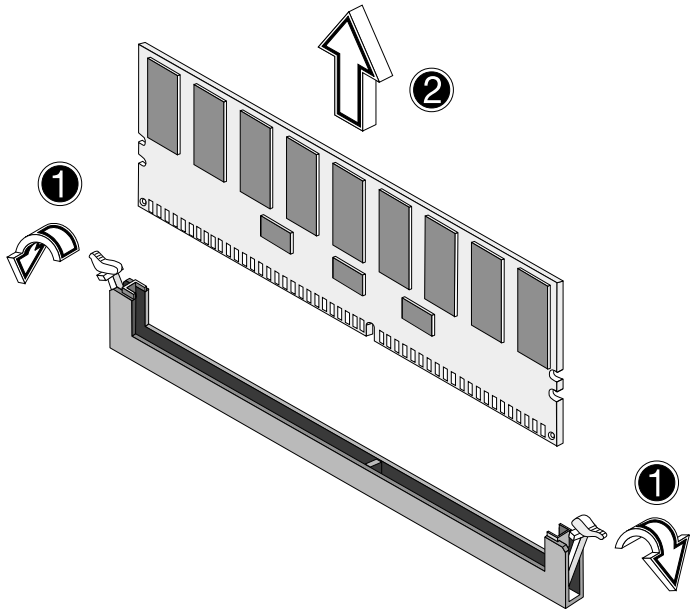
To remove a DIMM, press the holding clips on both sides of the socket outward to release the DIMM.



Note: Place your forefingers on the top of the DIMM before you press the holding clips to gently disengage the DIMM from the socket.

Reconfiguring the system

The system automatically detects the amount of memory installed. Run Setup to view the new value for total system memory and make a note of it.

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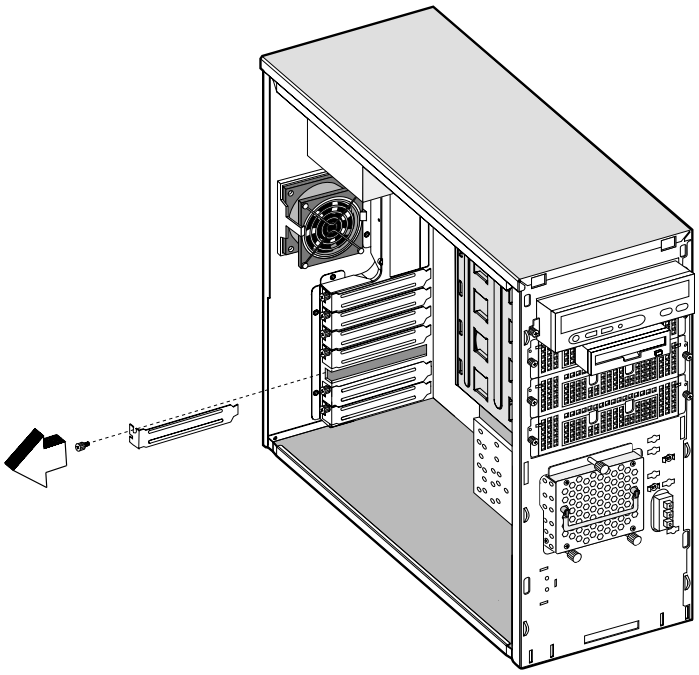
Installing expansion cards

There are two kinds of expansion slots available in this system board. These are 32-bit PCI (Peripheral Component Interconnect) and 64-bit PCI.

To install expansion cards:

1 Locate an empty expansion slot on the system board.

2 Remove the metal bracket located opposite the empty expansion slot using a Phillips screwdriver.



3 Insert an expansion card into the slot. Make sure that the card is properly seated.

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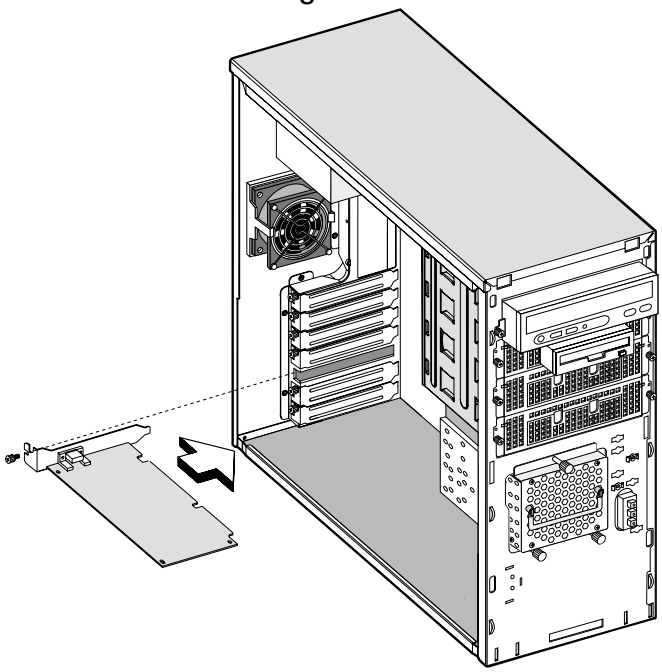
4 Secure the card to the housing with a screw.



When you turn on the system, BIOS automatically detects and assigns resources to the new device.

Note: BIOS detects and configures only PnP (Plug n Play) expansion cards.

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4 Setup utility

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This chapter gives information about the system BIOS and tells how to configure the system by changing the settings of the BIOS parameters.

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Introduction

Most systems are already configured by the manufacturer or the dealer. There is no need to run Setup when starting the computer unless you get a Run Setup message.

The Setup program loads configuration values into the battery-backed nonvolatile memory called CMOS RAM. This memory area is not part of the system RAM.

Note: If you repeatedly receive Run Setup messages, the battery may be bad. In this case, the system cannot retain configuration values in CMOS. Ask a qualified technician for assistance.

Before you run Setup, make sure that you have saved all open files. The system reboots immediately after you exit Setup.

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Setup Menu

The computer employs the latest AMI BIOS CMOS chip with support for Windows Plug and Play. This CMOS chip contains the ROM Setup instructions for configuring the mainboard's BIOS. The BIOS (Basic Input and Output System) Setup utility is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. BIOS is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters. These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS.

Configure such items as:

- Hard drives, diskette drives, and peripherals
- Password protection from unauthorized use
- Power Management Features

This Setup utility should be executed under the following conditions:

- When changing the system configuration
- When a configuration error is detected by the system and you are prompted to make changes to the Setup utility
- When redefining the communication ports to prevent any conflicts
- When making changes to the Power Management configuration
- When changing the password or making other changes to the security setup

BIOS Setup Options at Boot

The user will be able to initiate SETUP by pressing the respective keys.
<CTRL>-<ALT>-<ESC>Enter the BIOS Setup

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Setup submenu: Main

Parameter	Description	Options
AMIBIOS Version	The core version of AMI BIOS.	N/A
BIOS Build Date	The date when the BIOS build.	N/A
BIOS ID	The version of current BIOS.	N/A
System Time	Use these items to set the correct time.	[HH:MM:SS]
System Date	Use these items to set the correct date.	[mm/dd/yyyy]
System Information	Display the system information.	N/A
Product Information	Display the product information.	N/A

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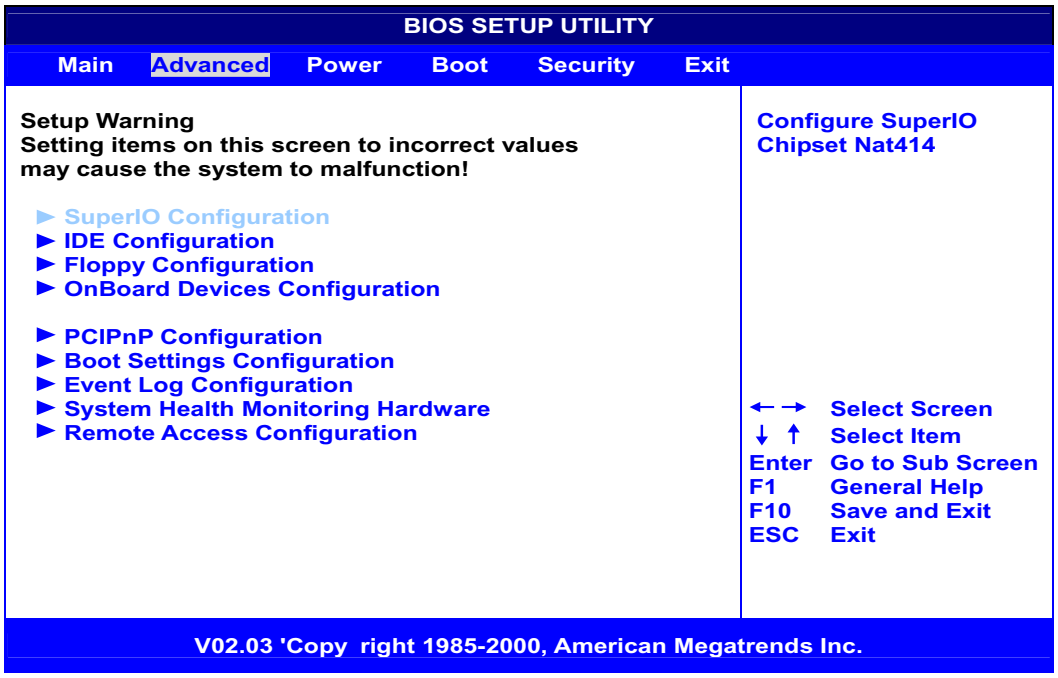
Setup submenu: Advanced


BIOS SETUP UTILITY
Main Advanced Power Boot Security Exit
Setup Warning
Setting items on this screen to incorrect values
may cause the system to malfunction!
► SuperIO Configuration
► IDE Configuration
► Floppy Configuration
► OnBoard Devices Configuration
► PCIPnP Configuration
► Boot Settings Configuration
► Event Log Configuration
► System Health Monitoring Hardware
► Remote Access Configuration
Configure SuperIO Chipset Nat414
← → Select Screen
↓ ↑ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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Parameter	Description
SuperIO Configuration	Configure SuperIO Chipset Nat414.
IDE Configuration	Configure the IDE device(s).
Floppy Configuration	Configure the Floppy drive(s).
OnBoard Devices Configuration	OnBoard devices control Enable/Disable.
PCIPnP Configuration	Legacy USB control and PCI slot IRQ preference assign.
Boot Settings Configuration	Boot Settings Configuration.
Event Log Configuration	Configure Event Logging.
System Health Monitoring Hardware	Configure System Health Monitoring Hardware parameters.

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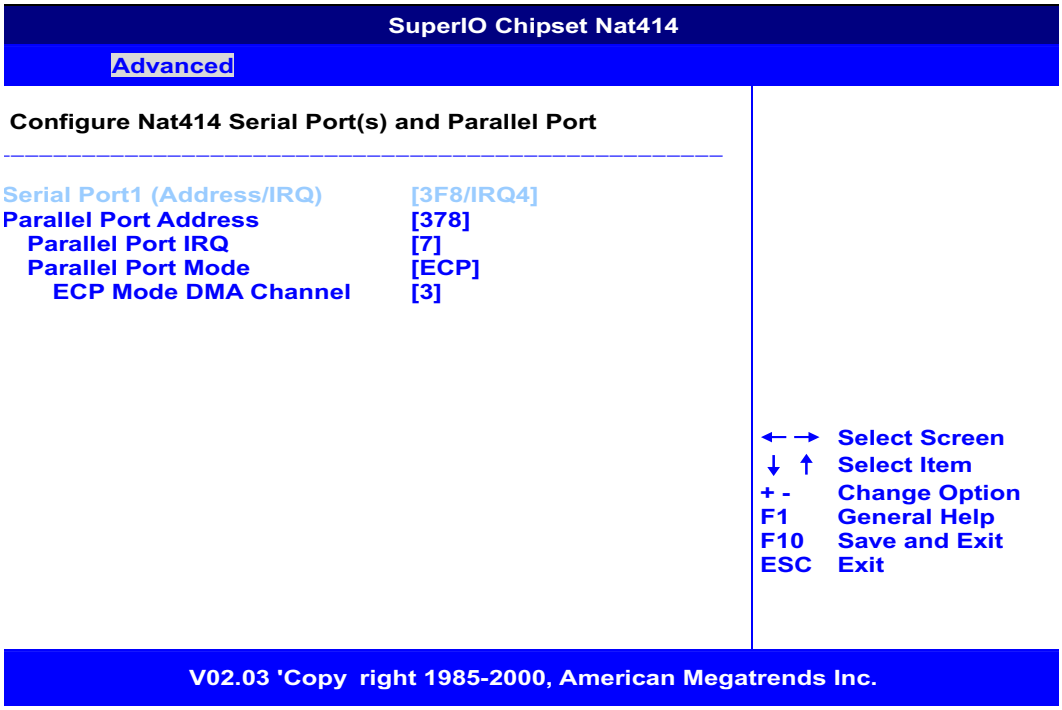
Parameter	Description
Remote Access Configuration	Configure Remote Access.

SuperIO Configuration



- **Onboard Serial Port 1**
  Use these items to disable the serial ports or to assign a port address and IRQ to the ports.
- **Onboard Parallel Port**
  Use this item to disable the parallel port or assign a port address to the parallel port.
- **Parallel Port IRQ**
  Use this item to determine the IRQ of the parallel port.
- **Parallel Port Mode Select**
  Use this item to determine the mode of the parallel port. You can select Normal, Bi-directional, EPP (Enhanced Parallel Port) or ECP (Extended Capabilities Port).
- **Parallel Port DMA Channel**
  These items are not available in most circumstances. If they are available, use them to allocate DMA (Direct Memory Access) channel for the parallel port.

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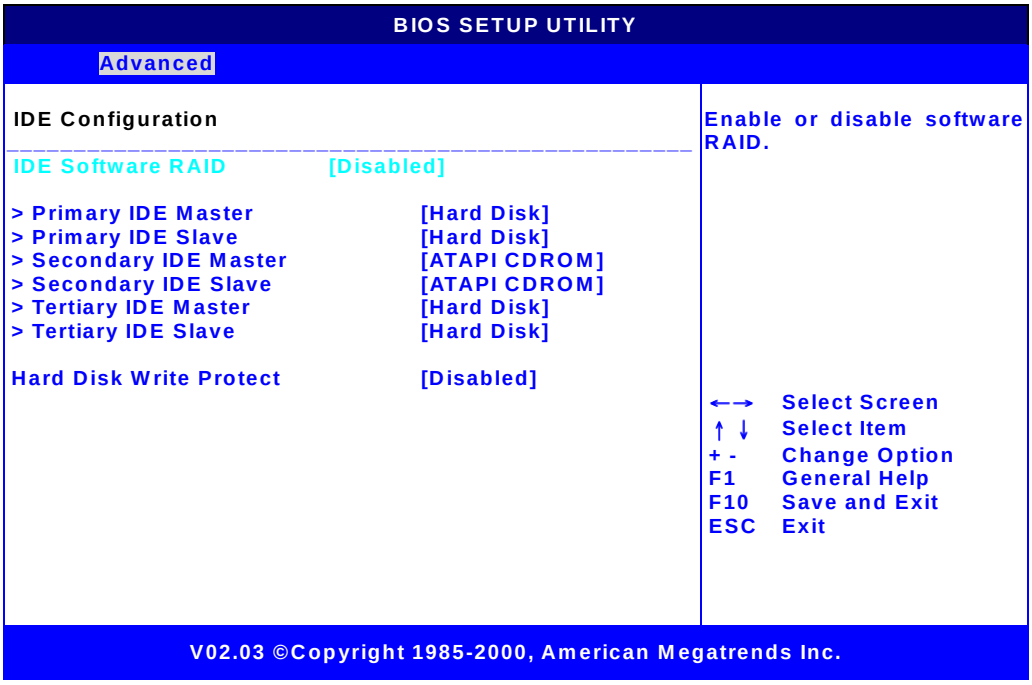
IDE Configuration


BIOS SETUP UTILITY
Advanced
IDE Configuration
IDE Software RAID [Disabled]
> Primary IDE Master [Hard Disk]
> Primary IDE Slave [Hard Disk]
> Secondary IDE Master [ATAPI CDROM]
> Secondary IDE Slave [ATAPI CDROM]
> Tertiary IDE Master [Hard Disk]
> Tertiary IDE Slave [Hard Disk]
Hard Disk Write Protect [Disabled]
Enable or disable software RAID.
←→ Select Screen
↑ ↓ Select Item
+ - Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Parameter	Description	Options
IDE Software RAID	This item enables or disables the software RAID in primary IDE channel and secondary IDE channel.	Enabled Disabled
Primary IDE Master	Device detected as primary IDE master.	Manual configure IDE device parameters if device could not been detected by BIOS.
Primary IDE Slave	Device detected as primary IDE slave.	
Secondary IDE Master	Device detected as secondary IDE master.	
Secondary IDE Slave	Device detected as secondary IDE slave.	
Third IDE Master	Device detected as third IDE master.	
Third IDE Slave	Device detected as third IDE slave.	

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Parameter	Description	Options
Hard Disk Write Protect	Disable/Enable device write protection. This will be effective only if device is accessed through BIOS.	Disabled Enabled

Auto Detect Hard Disks

This item automatically detects and installs any hard disk drives installed on the primary and secondary IDE channels. Most modern drives can be detected. If you are using a very old drive that can't be detected, you can install it manually.

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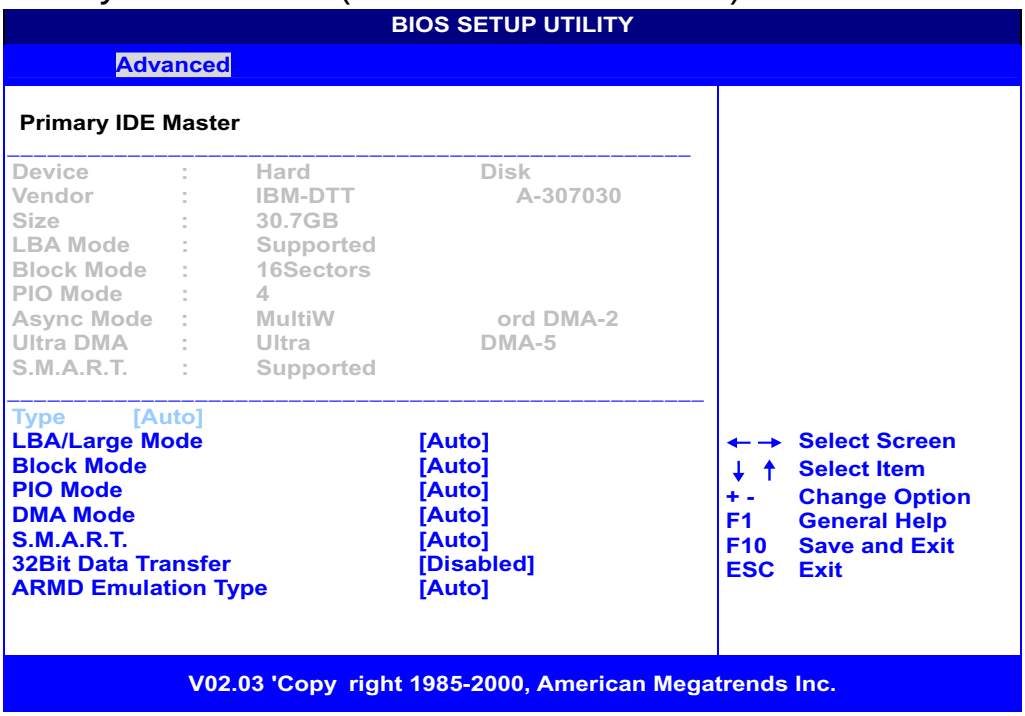
Primary IDE Master (if attached Hard Disk)



Parameter	Description	Options
Type	Configure the driver type.	Auto CDROM ARMD Not Installed
LBA/Large Mode	Select the hard disk drive translation method. For drivers with more than 504MB, the LBA mode is necessary.	Auto Disabled
Block Mode	**Auto:** The Data transfer from and to the device occurs multiple sectors at a time if the device supports it. **Disable:** The Data transfer from and to the device occurs one sector at a time.	Auto Disabled

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Parameter	Description	Options
PIO Mode	Select PIO (Programmed Input/ Output) Mode. Mode 0 to 4 provide successive increase of performance.	Auto 0 1 2 3 4
DMA Mode	Select DMA Mode: **Auto**: Auto detected **SWDMAn**: SingleWordDMAn **MWDMAn**: MultiWordDMAn **UDMAn**: UltraDMAn	Auto SWDMAn MWDMAn UDMAn
S.M.A.R.T.	Enable or disable the S.M.A.R.T (Self-Monitoring, Analysis and Reporting Technology) in the internal hard disk. If '**Auto**' is selected, the BIOS will enable the S.M.A.R.T if the drive supports it.	Auto Disabled Enabled
32Bit Data Transfer	Enable/disable 32bit data transfer.	Enabled Disabled
ARMD Emulation Type	Select ARMD device emulation type by BIOS.	Auto Floppy Hard Disk

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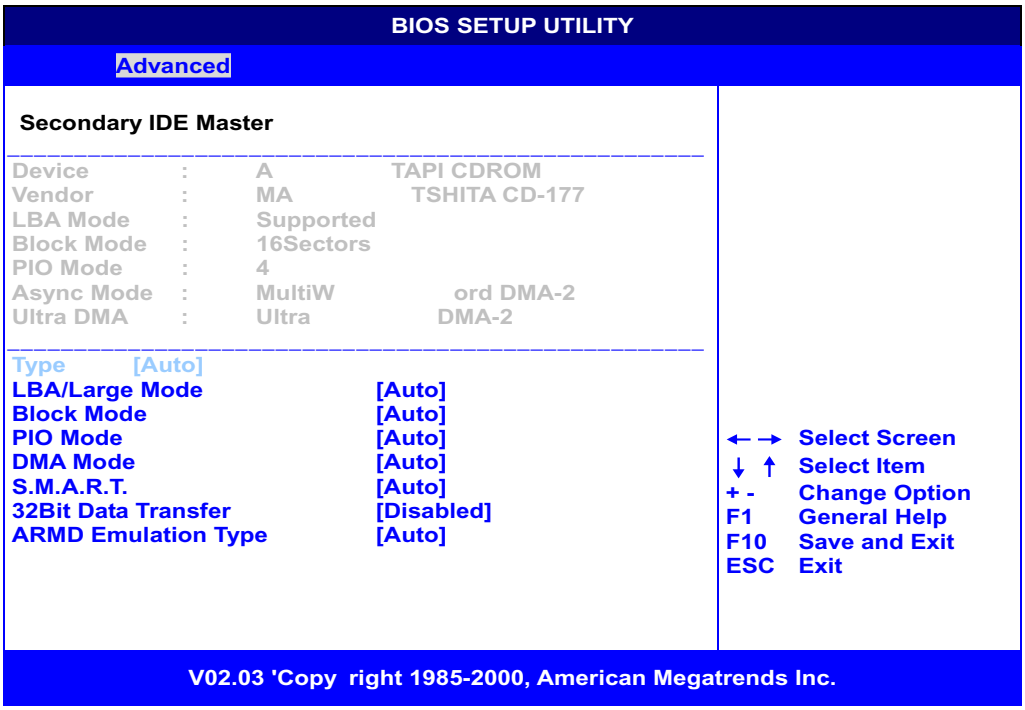
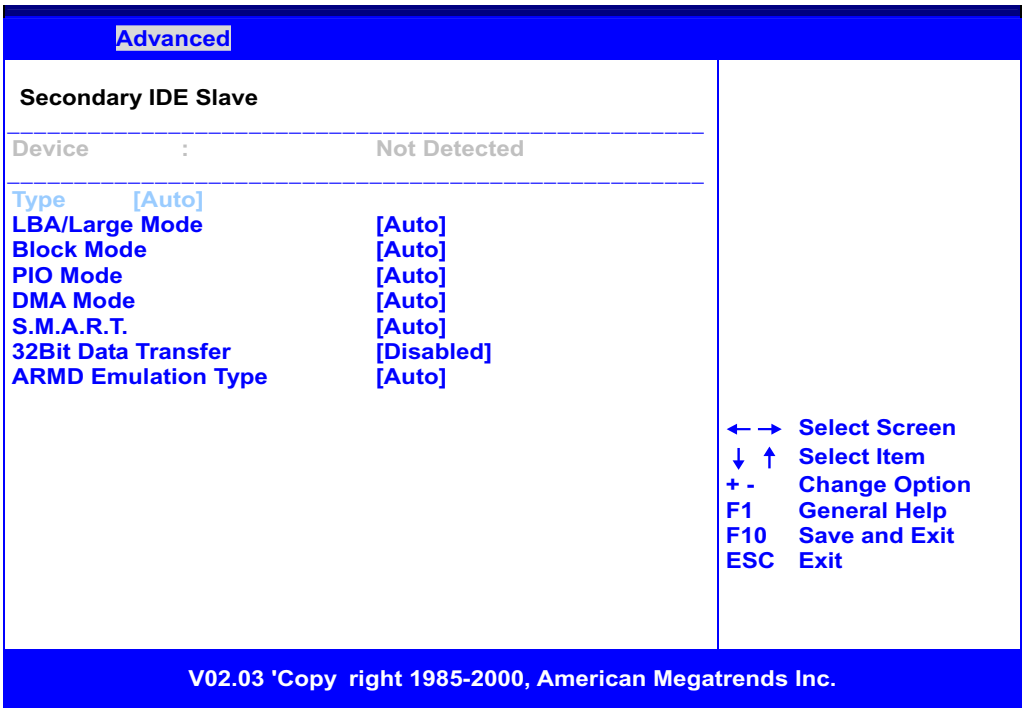
Secondary IDE Master (if attached ATAPI CDROM)



Secondary IDE Slave (if none attached)



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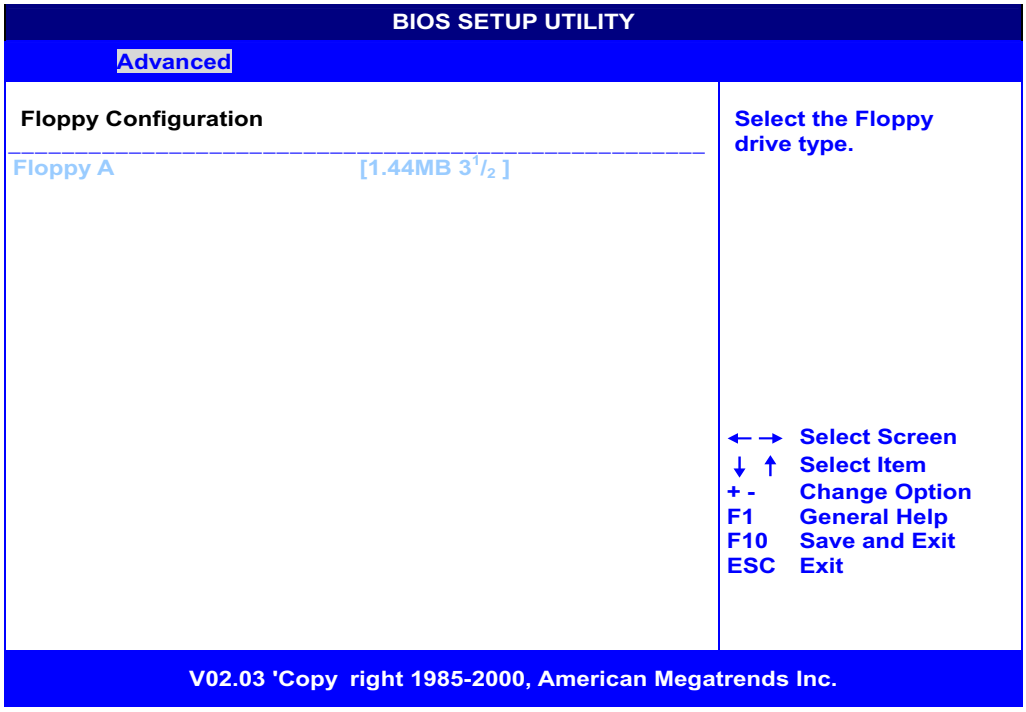
Floppy Configuration



Parameter	Description
Floppy Drive A	Select the floppy drive type

- **Floppy Drive A**
  If you have one floppy drive installed change the item Floppy Drive A so that it describes the characteristics of the drive.

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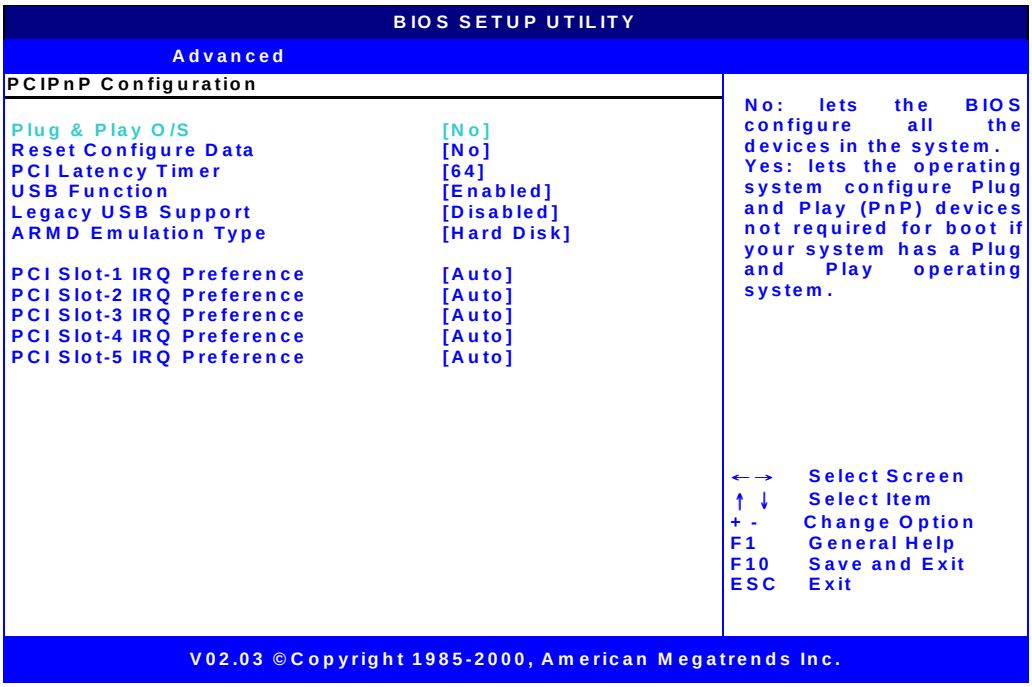
PCIPnP Configuration


BIOS SETUP UTILITY
Advanced
PCIPnP Configuration
Plug & Play O/S [No]
Reset Configure Data [No]
PCI Latency Timer [64]
USB Function [Enabled]
Legacy USB Support [Disabled]
ARMD Emulation Type [Hard Disk]
PCI Slot-1 IRQ Preference [Auto]
PCI Slot-2 IRQ Preference [Auto]
PCI Slot-3 IRQ Preference [Auto]
PCI Slot-4 IRQ Preference [Auto]
PCI Slot-5 IRQ Preference [Auto]
No: lets the BIOS configure all the devices in the system. Yes: lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.
←→ Select Screen
↑ ↓ Select Item
+ - Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Parameter	Description	Options
Plug & Play O/S	No: lets the BIOS configure all the devices in the system. Yes: lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.	Yes No
Reset Configure Date	NO: does not force the PnP data to be cleared on boot. YES: clears PCI/PnP Configuration Data stored in Flash on next boot.	Yes No
PCI Latency Timer	Value in units of PCI clocks for PCI device latency timer register.	
USB Function	On/Off to enable/disable the USB function in Chipset.	Enabled Disabled
Legacy USB Support	Enables support for legacy USB.	Enabled Disabled

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Parameter	Description	Options
ARMD Emulation Type	Sets the emulation type for USB ZIP drive.	
PCI Slot-1 IRQ Preference	Manually set the PCI slot IRQ value slot-1.	Auto 3 4 5 7 9 10 11 12 14 15
PCI Slot-2 IRQ Preference	Manually set the PCI slot IRQ value slot-2.	
PCI Slot-3 IRQ Preference	Manually set the PCI slot IRQ value slot-3.	
PCI Slot-4 IRQ Preference	Manually set the PCI slot IRQ value slot-4.	
PCI Slot-5 IRQ Preference	Manually set the PCI slot IRQ value slot-5.	

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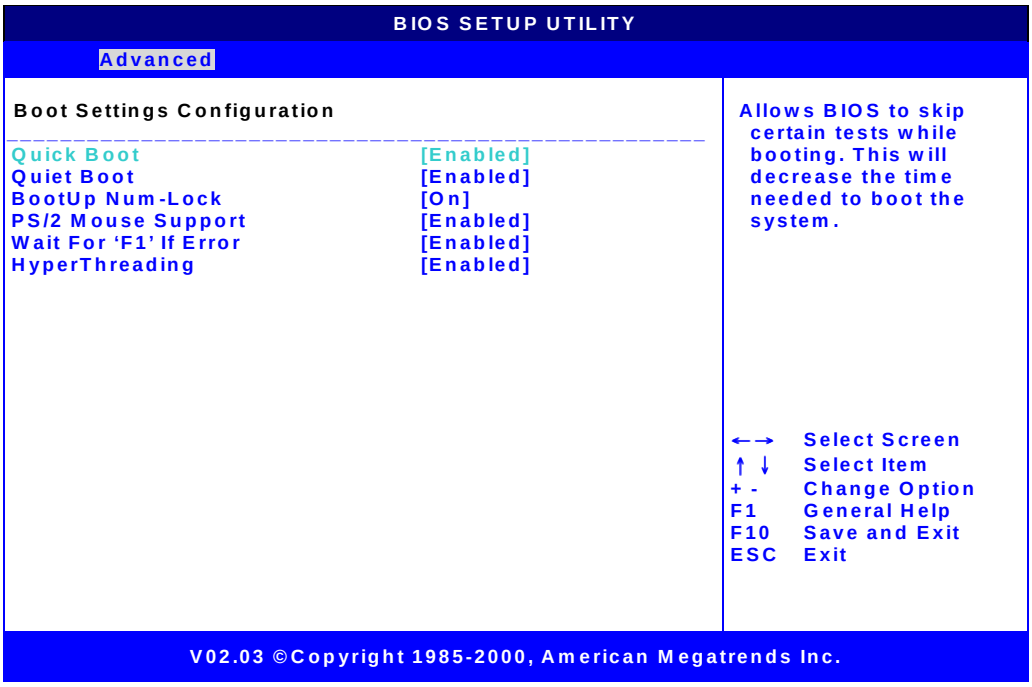
Boot Settings Configuration


BIOS SETUP UTILITY
Advanced
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Enabled]
BootUp Num-Lock [On]
PS/2 Mouse Support [Enabled]
Wait For 'F1' If Error [Enabled]
HyperThreading [Enabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
←→ Select Screen
↑ ↓ Select Item
+ - Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Parameter	Description	Options
Quick Boot	Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.	
Quiet Boot	Disabled: Displays normal POST messages. Enabled: Displays OEM Logo instead of POST messages.	
Bootup Num-Lock	Select Power-on state for NumLock	On Off
PS/2 Mouse Support	Enable/Disable PS/2 mouse support by BIOS.	Enabled Disabled
Wait For 'F1' if Error	Enable/Disable ëF1í key wait if some POST error occurred.	Enabled Disabled
Hyper Threading	Enabled: Enable CPU Hyper-Threading for HT enabled processor(s). Disabled: Disable CPU Hyper-Threading for HT enabled processor(s).	Enabled Disabled

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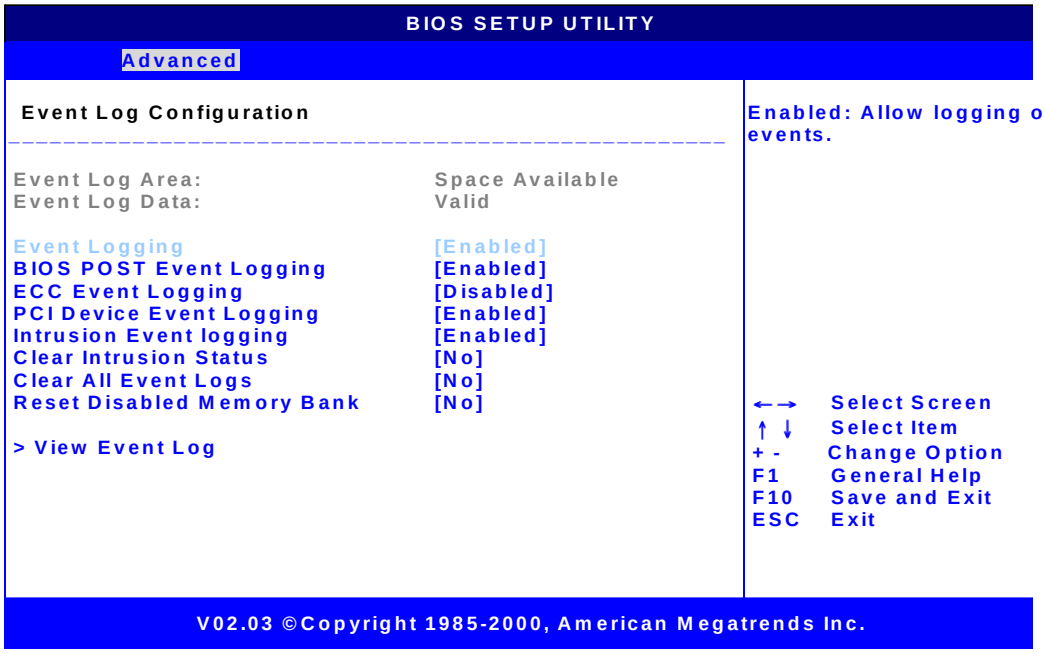
Event Log Configuration



Note: If there are any event logs recorded, “View Event Log” will appear. If no event recorded, this option will NOT appear.

Parameter	Description	Options
Event Log Area	The space utilization of event log NVRAM. If space is full, no new event type could be record.	
Event Log Data	The state of event log data. The event log data is only available if ‘**valid**’.	
Event Logging	Allow/Not allow logging of events.	Enabled Disabled
BIOS POST Event Logging	Allow/Not allow logging of BIOS POST events.	
ECC Event Logging	Allow/Not allow logging of ECC events.	Enabled Disabled

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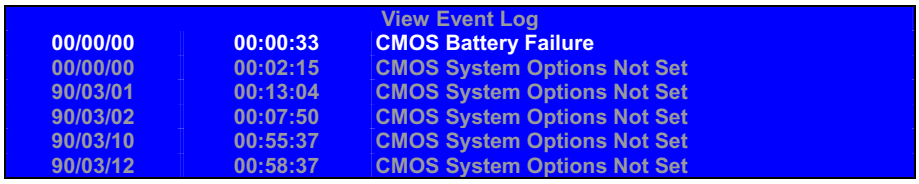
Parameter	Description	Options
PCI Device Event Logging	Allow/Not allow logging of PCI PERR error events.	
Intrusion Event logging	Allow/Not allow logging of chassis intrusion events.	Enabled Disabled
Clear Intrusion Status	Clear chassis intrusion status and set this value as '**disabled**' at next time system boot if this item is enabled.	Yes No
Clear All Event Logs	Clear event log area and set this value as '**disabled**' at next time system boot if this item is enabled.	Yes No
Reset Disabled Memory Bank	Enable all memory banks on next boot. Memory DIMM might be disabled by memory reduction feature.	
View Event Log	This allows user to see the detail BIOS and IPMI event.	N/A

View Event Log

This allows user to see the detail BIOS and IPMI event.


View Event Log
00/00/00 00:00:33 CMOS Battery Failure
00/00/00 00:02:15 CMOS System Options Not Set
90/03/01 00:13:04 CMOS System Options Not Set
90/03/02 00:07:50 CMOS System Options Not Set
90/03/10 00:55:37 CMOS System Options Not Set
90/03/12 00:58:37 CMOS System Options Not Set

Mark All Events As Read

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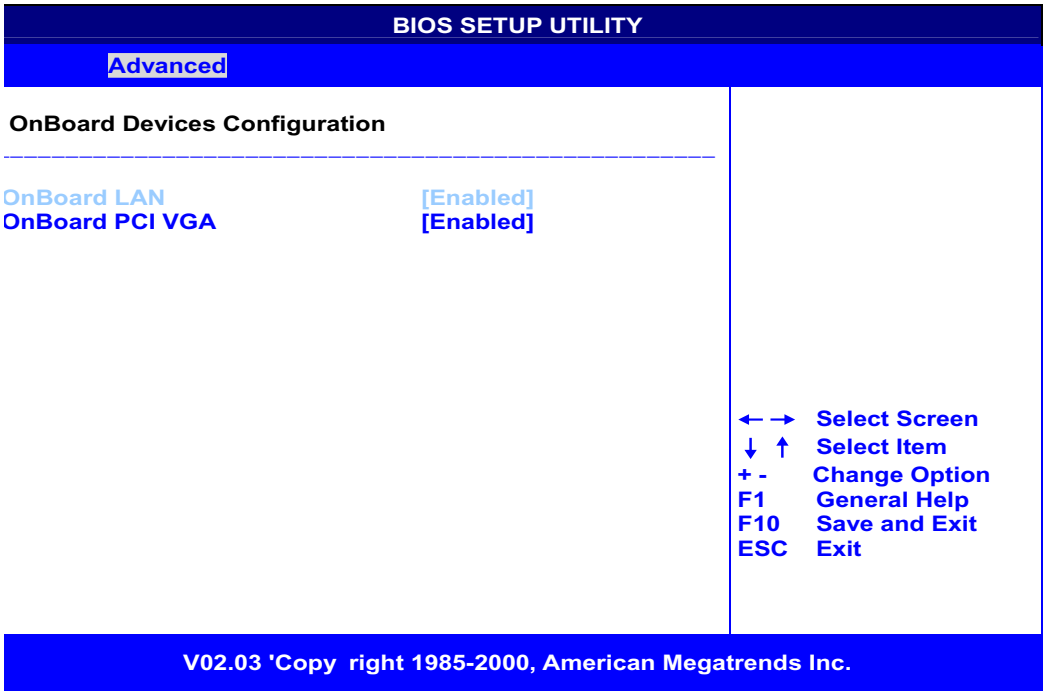
OnBoard Devices Configuration



Parameter	Description	Options
OnBoard LAN	Enable or disable onboard LAN.	Enabled Disabled
OnBoard PCI VGA	Enable or disable onboard VGA.	Enabled Disabled

System Health Monitoring Hardware

Hardware Monitor Setup Page

This page lets you install hardware monitoring parameters so that the system can warn you when critical parameters are exceeded.

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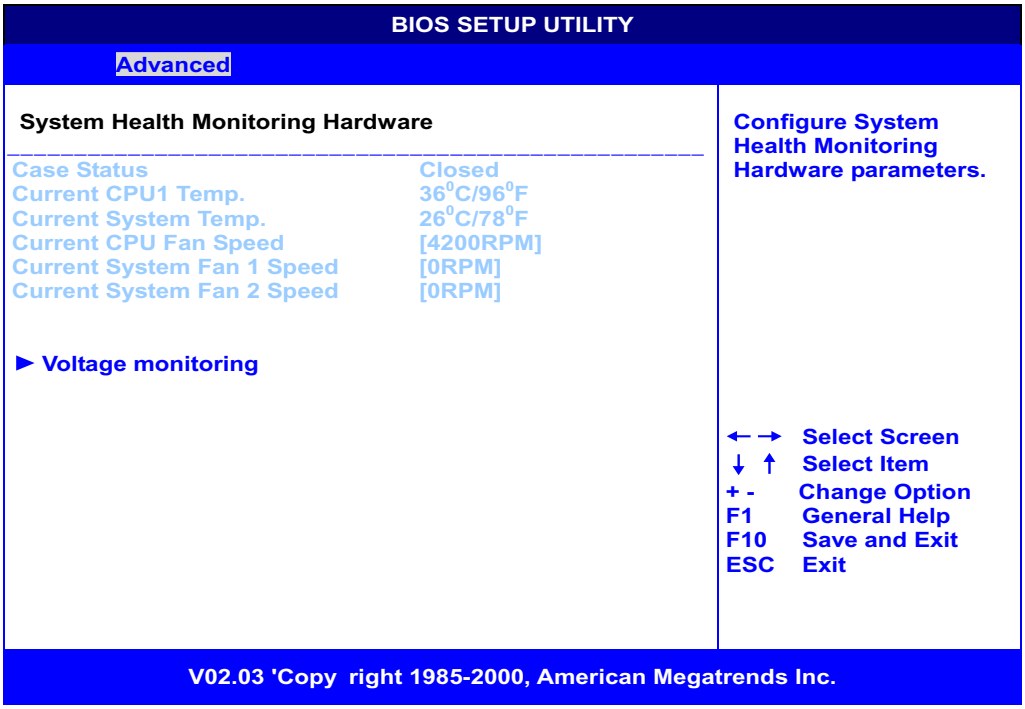
System Hardware Monitor

If your mainboard supports hardware monitoring, these items are auto-detected and the results are reported. You cannot make changes to these items.


BIOS SETUP UTILITY
Advanced
System Health Monitoring Hardware
Case Status Closed
Current CPU1 Temp. 36°C/96°F
Current System Temp. 26°C/78°F
Current CPU Fan Speed [4200RPM]
Current System Fan 1 Speed [0RPM]
Current System Fan 2 Speed [0RPM]
► Voltage monitoring
Configure System Health Monitoring Hardware parameters.
←→ Select Screen
↓ ↑ Select Item
+ - Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Parameter	Description
Case Status	The current status detected by chassis intrusion switch.
Current CPU Temp	Current CPU temperature detected by the sensor on the board.
Current System Temp	Current board temperature detected by the sensor on the board.
Current CPU Fan Speed	Current CPU Fan speed detected.
Current System Fan 1 Speed	Current System Fan 1 speed detected.
Current System Fan 2 Speed	Current System Fan 2 speed detected.

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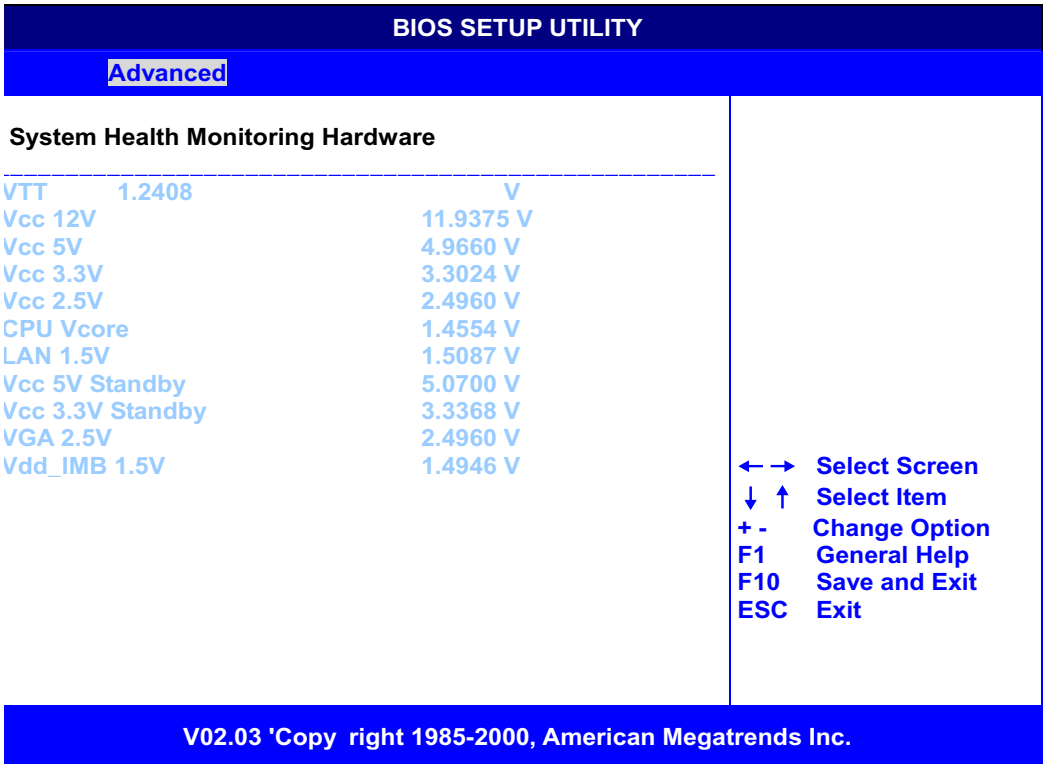
Parameter	Description
Voltage monitoring	Press '**Enter**' to view the voltage monitored.

Voltage monitoring



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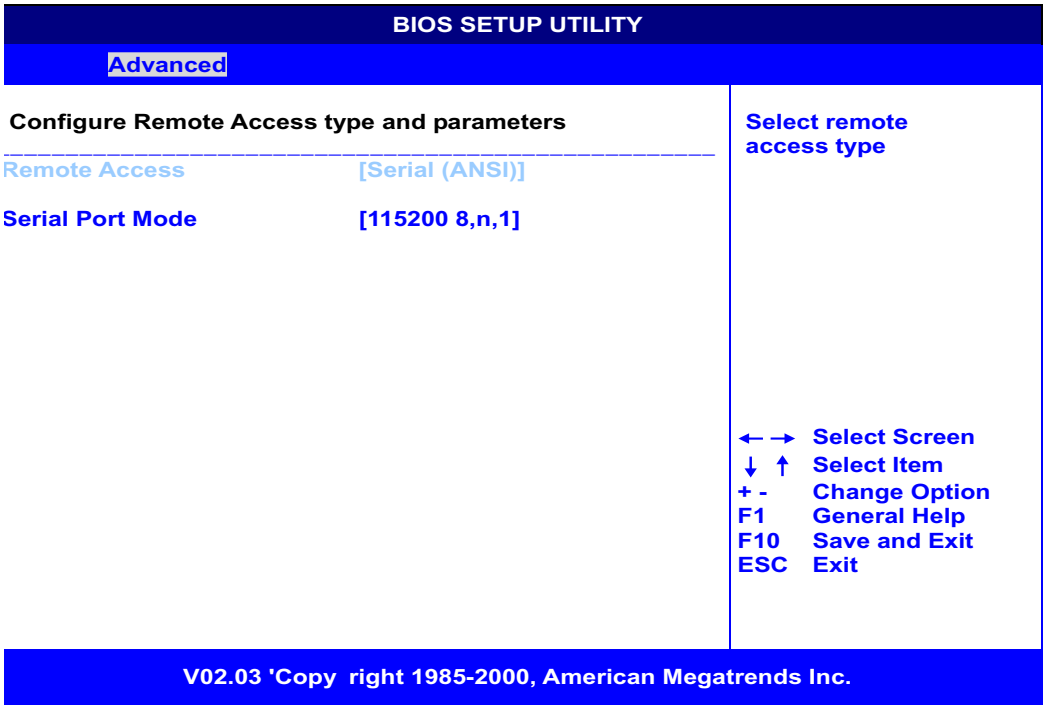
Remote Access Configuration



Parameter	Description	Options
Remote Access	Select remote access type.	Disabled Serial (ANSI)
Serial Port Mode	Select Serial Port setting.	115200 8,n,1 57600 8,n,1 19200 8,n,1 9600 8,n,1

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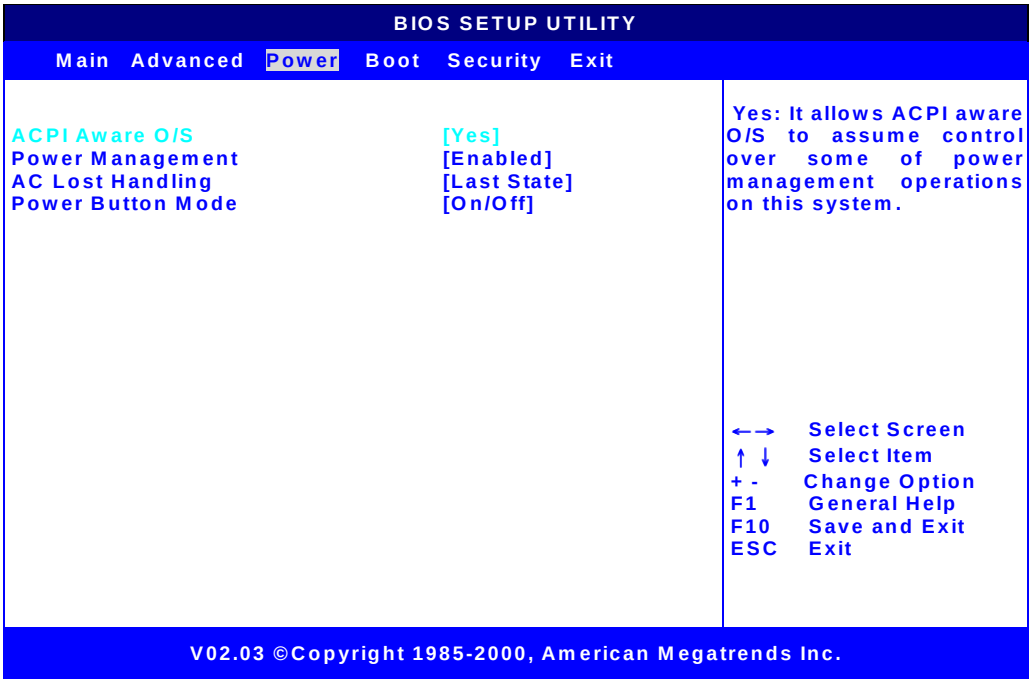
Setup submenu: Power



Parameter	Description	Options
ACPI Aware O/S	Enable / Disable ACPI support for Operating System. ENABLE: If OS supports ACPI. DISABLE: If OS does not support ACPI.	Enabled Disabled
Power Management	Enable or disable APM support.	Enabled Disabled
AC Lost Handling	This sets the power state after a shutdown due to an unexpected interrupt of AC power. If the value is set to Stay OFF, the system remains turned off. If the value is set to Last State, the system returns to the last power state.	Last State Stay Off
Power Button Mode	If this item is set to On/Off, the power button acts as a standard on/off switch. If you set this item to Suspend, pressing the power button enters the system into a power-saving suspend mode.	On/Off Suspend

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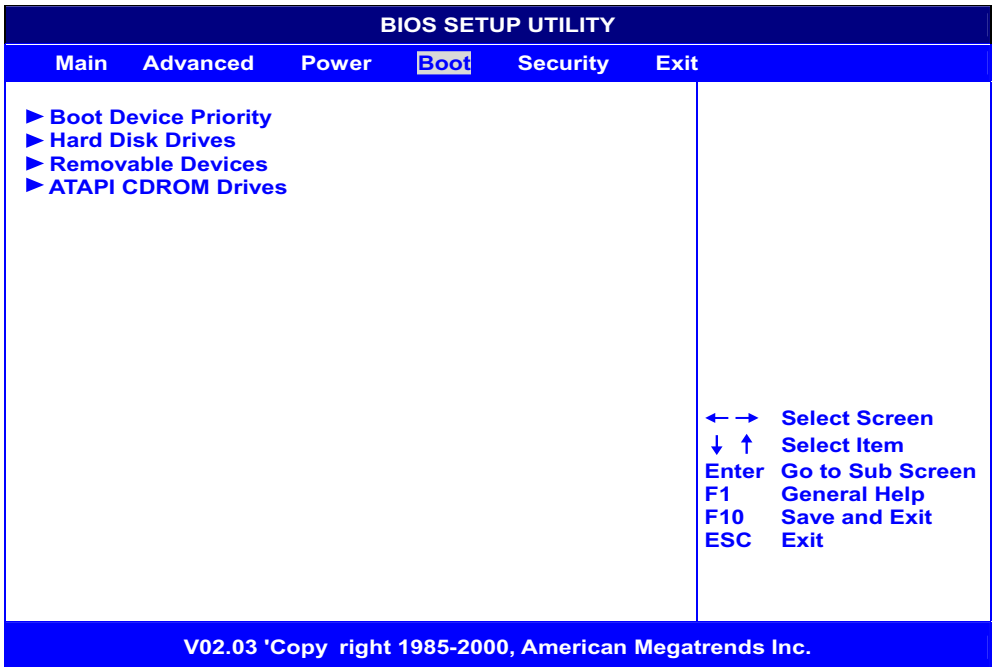
Setup submenu: Boot


BIOS SETUP UTILITY
Main Advanced Power Boot Security Exit
► Boot Device Priority
► Hard Disk Drives
► Removable Devices
► ATAPI CDROM Drives
←→ Select Screen
↓ ↑ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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Parameter	Description
Boot Device Priority	Specifies the boot sequence from the available devices.
Hard Disk Drives	Specifies the available hard disk drives boot sequence. Only first drive could boot the system.
Removable Devices	Specifies the available removable devices boot sequence. Only first drive could boot the system.
ATAPI CDROM Drives	Specifies the available CD-ROM drives boot sequence. Only first drive could boot the system.

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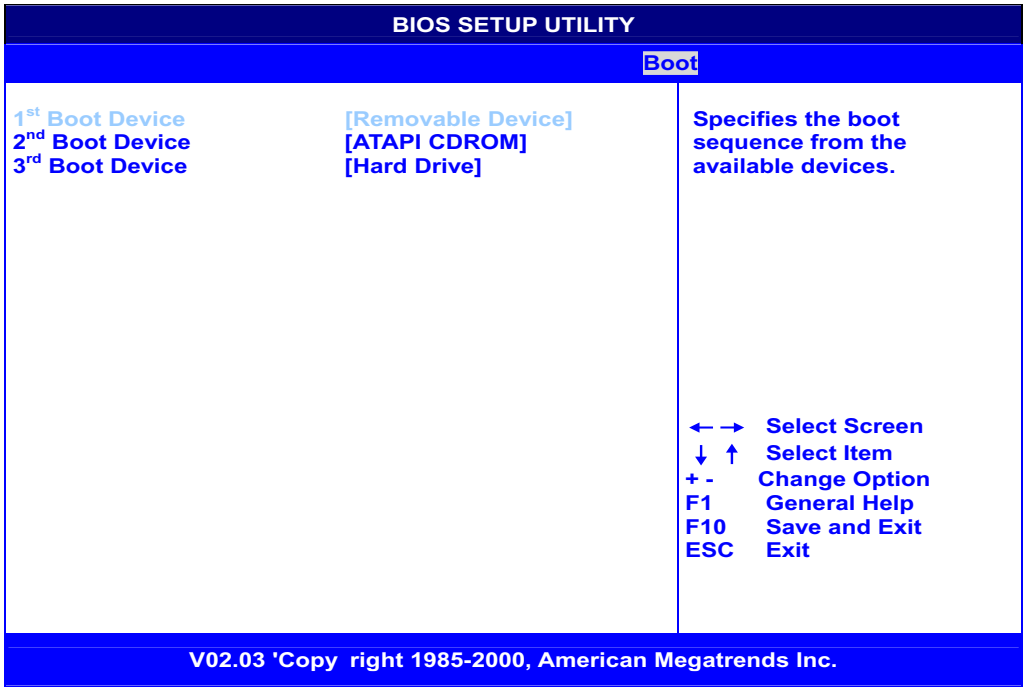
Boot Device Priority



Parameter	Description	Options
1st Boot Device	Configure the first boot device type.	Available boot device type.
2nd Boot Device	Configure the second boot device type. If first boot device fail to boot the system, BIOS will try to boot the system from 2nd boot device.	
...		
Nth Boot Device	Configure the N-th boot device type. If N-1 th boot device fail to boot the system, the BIOS will try to boot the system from N-th boot device.	

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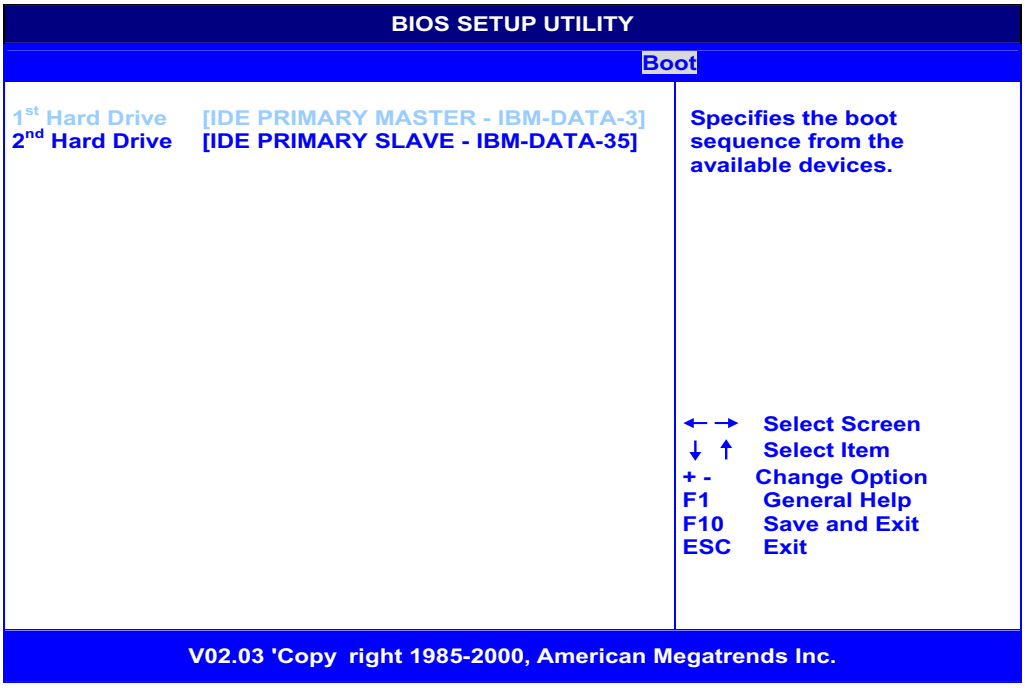
Hard Disk Drives


BIOS SETUP UTILITY
Boot
1st Hard Drive [IDE PRIMARY MASTER - IBM-DATA-3]
2nd Hard Drive [IDE PRIMARY SLAVE - IBM-DATA-35]
Specifies the boot sequence from the available devices.
←→ Select Screen
↓ ↑ Select Item
+ - Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Parameter	Description
1st Hard Drive	Configure the hard drive to boot the system.
2nd Hard Drive	Configure the 2nd hard drive. Note that only 1st hard drive could boot the system.

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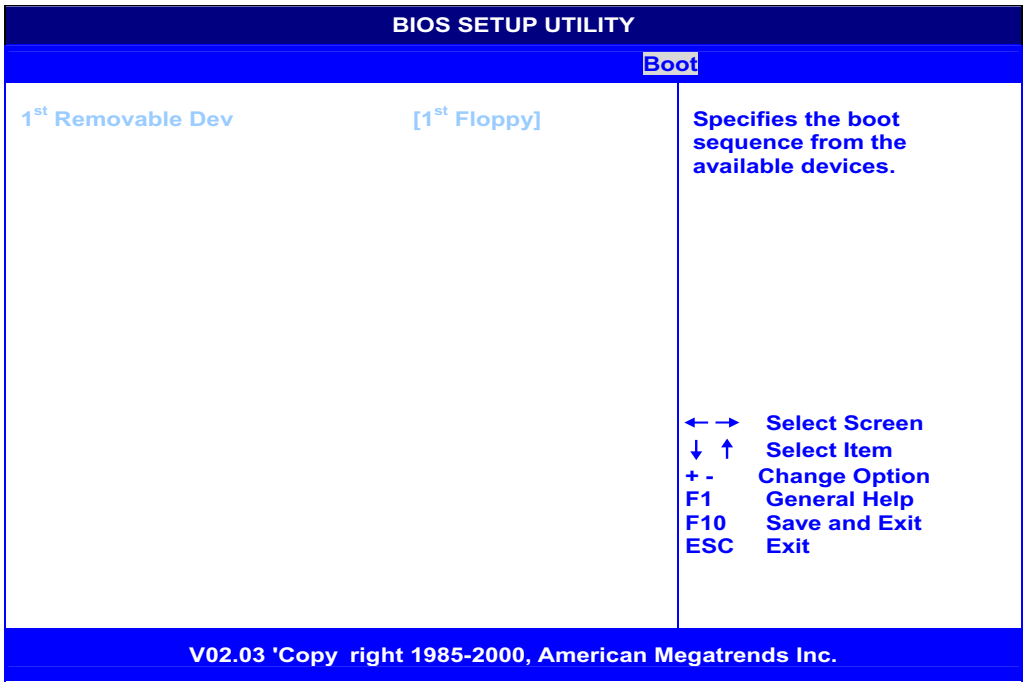
Removable Devices



Parameter	Description
1st Removable Dev	Configure the 1st removable device to boot the system.

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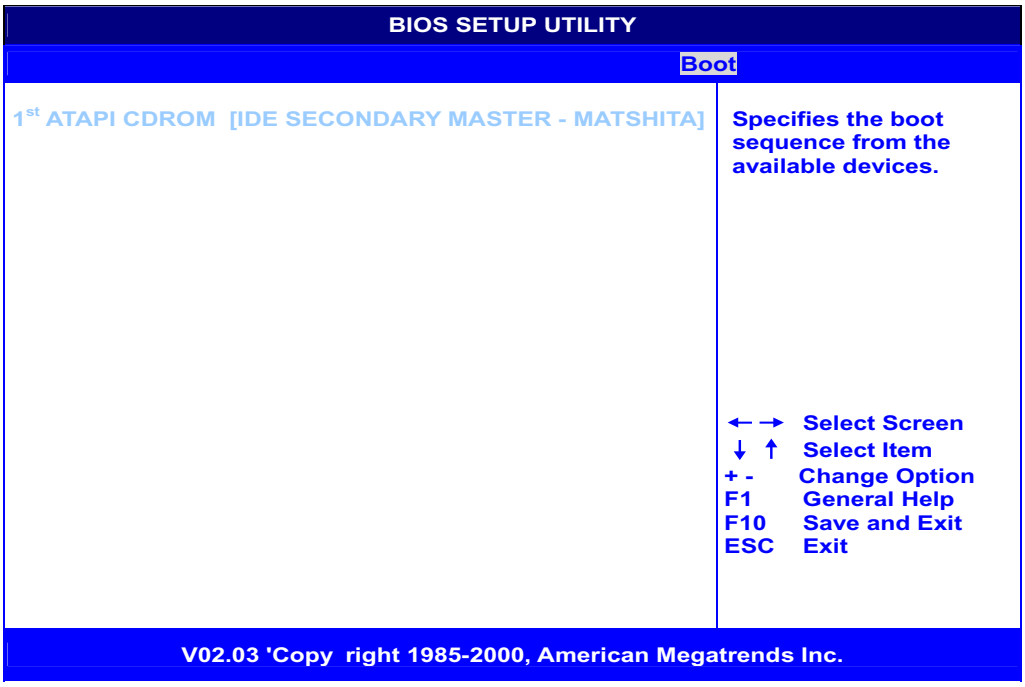
ATAPI CDROM Drives


BIOS SETUP UTILITY
Boot
1st ATAPI CDROM [IDE SECONDARY MASTER - MATSHITA]
Specifies the boot sequence from the available devices.
Select Screen
Select Item
+ - Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Parameter	Description	Options
1st ATAPI CDROM	Configure the first ATAPI CDROM to boot the system. Only first CDROM could boot the system.	CD-ROM available to the system.

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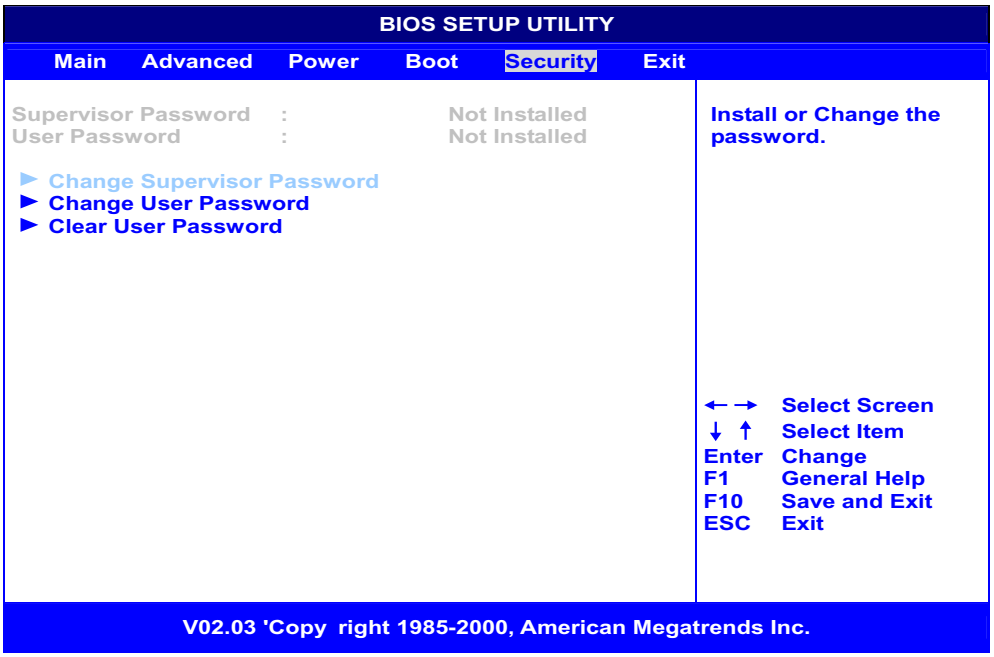
Setup submenu: Security



Parameter	Description
Change User/ Supervisor Password	You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.If you highlight these items and press **Enter**, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press **Enter** after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press **Enter** after you have retyped it correctly. The password is required at boot time, or when the user enters the Setup utility. The characters allow for password are [‘a’-’z’, ‘A’-’Z’, ‘0’-’9’]. Six characters are allowed for a password.
Clear User Password	Highlight this item and type in the current password. At the next dialog box press **Enter** to disable password protection.

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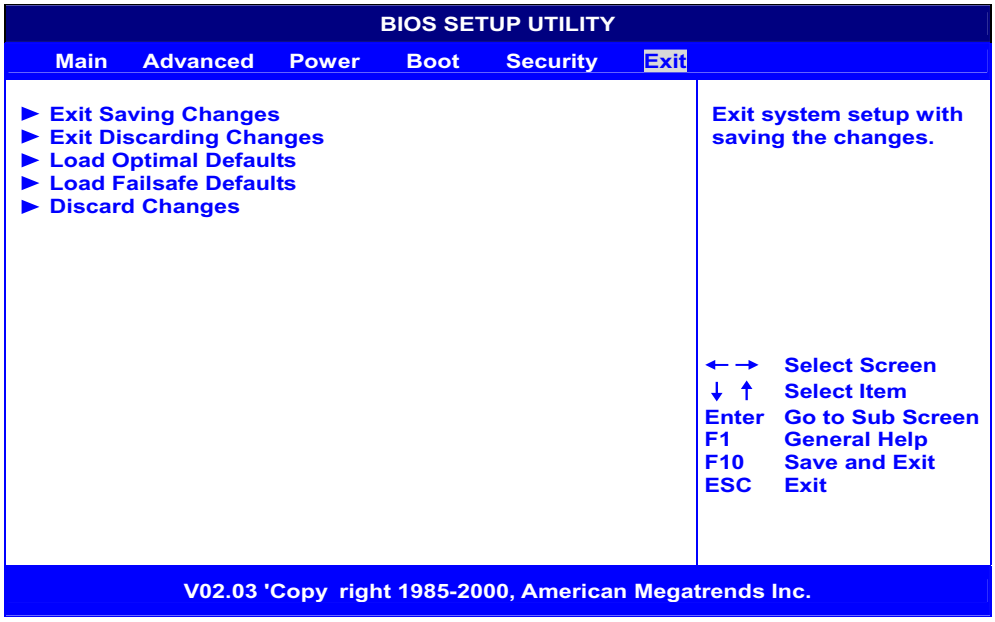
Setup submenu: Exit


BIOS SETUP UTILITY
Main Advanced Power Boot Security Exit
► Exit Saving Changes
► Exit Discarding Changes
► Load Optimal Defaults
► Load Failsafe Defaults
► Discard Changes
Exit system setup with saving the changes.
←→ Select Screen
↓ ↑ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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Parameter	Description
Exit Saving Changes	Exit system setup with saving the changes.
Exit Discarding Changes	Exit system setup without saving the changes.
Load Optimal Defaults	Load Optimal Defaults.
Load Failsafe Defaults	Load Failsafe Defaults.
Discard Changes	Discard changes.

Auto Configuration with Optimal Settings

If you highlight this item and press **Enter**, a dialog box asks if you want to install optimal settings for all the items in the Setup utility. Press the **Y** key to indicate Yes, and then press **Enter** to install the optimal settings.

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The optimal settings default values are quite demanding and your system might not function properly if you are using slower memory chips or other kinds of low-performance components.

Auto Configuration with Fail-Safe Settings

If you highlight this item and press **Enter**, a dialog box asks if you want to install fail-safe settings for all the items in the Setup utility. Press the **Y** key to indicate Yes, and then press **Enter** to install the fail-safe settings.

The fail-safe settings default values are not demanding so a system should be able to operate with the fails safe settings even if it is installed with slower memory chips or other kinds of low-performance components.

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5 Configuring IDE Software RAID

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This chapter gives information about configuring RAID IDE and arrays, assigning RAID levels, planning the arrayconfiguration, optimizing storage and using the RAID IDE Setup Utility.

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Configuring Arrays

Organize the physical disk drives in arrays after the drives are connected to IDE software RAID. And array can consist of one to four physical disk drives, depending on the RAID level.

Configuration Strategies

The most important factors in RAID array configuration are drive availability (fault tolerance), and drive performance.

Maximizing Drive Availability - You can maximize the drive availability by increasing fault tolerance. Use RAID 1 or mirror configuration to maximize availability.

Maximizing Drive Performance - You can optimize drive performance by using striping. Select RAID 0 or striping to configure an array for optimal performance.

Performance and Availability - You can achieve both drive performance and availability. Select RAID 10 for this configuration. You will need four drives to configure RAID 10.

Assigning RAID Levels

Only one RAID level can be assigned to each array. The drives required per RAID level is

RAID Level	Minimum Number of Drives	Maximum Number of Drives
0	One	Four
1	Two	Two
10	Four	Four

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Selecting a RAID Level

To ensure the best performance, you should select the optimal RAID level when you create a system drive. The optimal RAID level for your disk array depends on the following factors:

- Number of drives in the disk array
- Capacity of the drives in the array
- Need for data redundancy
- Disk performance requirements

The factors you need to consider when selecting a RAID level are listed below.

RAID Level	Description and Use	Pros	Cons	Number of Drives	Fault Tolerant
0	Data divided in blocks and distributed sequentially (pure striping). Use for non-critical data that requires high performanc e.	High data throughput for large files.	No fault tolerance. All data lost if any drive fails.	One to Four	No
1	Data duplicated on another disk (mirroring). Use for read-intensive fault tolerant systems	100 percent data redundancy	Double disk space. Reduced performance during rebuilds.	Two	Yes
10	Data divided in blocks and distributed sequentially and each block is duplicated to another disk.	100 percent data redundancy and High data throughput.	A minimum of four drives required.	Four	Yes

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Configuring Arrays

After you have enabled IDE Software RAID in BIOS and have attached all physical disk drives, perform the following actions to prepare a RAID disk array

Step	Action
1	Press <CTRL>+<M> to run the IDE Software RAID Manager
2	Define and configure one or more logical drives.
3	Create and configure one or more system drives (logical drives).
4	Save the configuration.
5	Initialize the system drives. After initialization, you can install the operating system.

Creating a Mirrored Array From an Existing Drive

To build a new mirrored array from an existing drive, connect the current drive and a new drive to the RAID card. Perform the following steps.

- Turn on the computer and Press <CTRL>+<M> to start the IDE Software RAID manager.
- Create an array by using Option F4. Change the array type to Mirror.
- Now include the existing drive and the new drive to this array. You can identify the existing drive and the new drive by their connection location.
- Start the rebuilding process by pressing <ENTER>. The setup will prompt for the target drive name. select the newly connected drive as the target drive by pressing <SPACE> and then <ENTER>.
- The rebuilding process will start. If there are any errors during the building of the array, you will be prompted with a message box. You can choose to ignore the error and proceed or stop the building process.

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Using the IDE Software RAID Setup Utility

The Setup window has three sections:

- Array Information
- Physical Drive Information
- Help

Only the Array Information and Physical Drive Information windows are active. The Array Information window can be edited, the Physical Drive Information window cannot.

To access the IDE Software RAID setup utility, press <CTRL>+<M> during boot-up.

Array Information - This section of the screen displays all the disk arrays configured. Use this section to create, delete or edit the existing configurations. The disk arrays are displayed as a node in a tree, as in Windows Explorer. When opened, each node displays the properties of the array. Press <UP ARROW> and <DOWN ARROW> no navigate the properties and press <ENTER> to edit your selection.

- Array configuration type or RAID level (Stripe, Mirror, RAID 10, or spare pool)
- Drive numbers of the physical drives included in the array
- Stripe size (32 KB to 4 MB) which is valid for stripe and RAID 10 configurations only.
- Whether the system is bootable from one of the configured arrays
- Build Array function, which is valid for Mirror and RAID 10 arrays. This option is used to build one drive from another.

The minimum stripe size allowed for RAID 10 configuration is 64 KB.

Physical Drive Information - This section displays all the physical drives connected to the IDE channels and their properties. The <UP ARROW> and <DOWN ARROW> are used to navigate the Physical Drive Information window.

- Channel ID (Primary or Secondary)
- Connection ID (Master or Slave)
- Disk array that the physical drive is a part of

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- Model number
- Size in MB of each drive
- The status of each drive (online, failed, or rebuilding)

Information listed in the Physical Drive Information window cannot be edited. Only the <TAB>, <UP ARROW>, and <DOWN ARROW> keys will work when the control is in the Physical Drive Information window.

Physical Drive Options - In the top right corner of the Physical Drive Information window are the Physical Drive Options. The following options are available:

- Enable/Disable write cache
- Boot sector virus protection
- DMA transfers

These options apply to all drives attached to the IDE software RAID.

Help Section - The help section of the Setup window displays hints on available options. The help section also provides a list of keys that you can use to perform tasks, such as auto-configuring or creating or deleting an array.

Auto Configure Stripe (F1)

Press the <F1> key to auto configure a stripe array. When you do this, IDE Software RAID automatically creates a Stripe based array based on the available physical drives attached. The Stripe size is set for the optimum level (64 KB).

Auto Configure Mirror (F2)

Press the <F2> key to run auto configuration. When you do this, IDE Software RAID automatically creates arrays based on the available physical drives. A minimum of two free physical drives are required for mirroring.

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Auto Configure RAID 10 (F3)

Press the <F3> key to auto configure the drives for a RAID 10 array. A minimum of four free physical drives are required for the RAID 10 auto configuration.

All previous settings will be lost when running Auto Configuration for Striping, Mirroring, or RAID 10.

Create Array (F4)

Press the <F4> key to create a disk array. When you create an array, a default array template is created. You must edit the array properties to complete the array creation. Use the arrow keys to highlight a property field and press <ENTER> to edit that property.

Array Type - By default arrays are created in Stripe mode. When you select this field, a pop-up window displays the following options:

- RAID mode
- STRIPE
- MIRROR
- RAID 10
- SPARE POOL

Select the intended RAID mode by using the arrow navigation keys and pressing <ENTER>. The SPARE POOL option is not a RAID mode, but a way to assign a physical drive as a hot spare to be used n case of a mirror failure. When a mirror configured array has a drive failure, a spare drive can be used to replace the failed drive and rebuild the array.

To rebuild a drive from the SPARE POOL, the size of the physical drive in SPARE POOL must be the same or larger than the smallest drive in the array.

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Drive(s) - There is no default setting for this field. You must select the drives for the configured array. When this field is selected, a pop-up window will display all the available physical drives with check boxes.

Drive Selection Box	
[ ]	Cntlr 0 - Primary Master
[ ]	Cntlr 0 - Primary Slave
[ ]	Cntlr 0 - Secondary Master
[ ]	Cntlr 0 - Secondary Slave

Use the arrow navigation keys and press <SPACE> to select or deselect the drive or drives to be put into the array. Press <ENTER> when done. If you select Mirror mode as the array type, you must select two drives to be in the array. This pop-up window will appear only when configuring RAID 0 (Stripe) and RAID 1 (Mirror) arrays. A RAID 10 array contains drives in each Stripe of the array and only two drives are allowed in each stripe. The maximum amount of Stripes is limited to four.

Stripe Size - This field applies to Stripe mode arrays only. By default, an array is set up with 64 KB stripes. Edit this field to change the default stripe size. The size options are:

- 32 KB
- 64 KB
- 128 KB
- 256 KB
- 512 KB
- 1024 KB
- 2048 KB
- 4096 KB

You cannot change the Stripe size of an array that has already been configured.

Bootable - This determines which of the configured arrays should be used for booting the system. The options are **YES** or **NO**.

You can select the boot device from the system BIOS Setup. Only one array is allowed to be bootable in a system.

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Drive Size - This field cannot be edited. It displays the size of the array. When the array type is Stripe, the drive size is the total of all the drives selected (one or more drives). When Mirror, drive size is shown by an individual drive, and for Spare Pool, drive size shows the total drive capacity.

Build Array - The build array option is valid for RAID 1 (Mirror) and RAID 10 arrays only. It is used to rebuild the array from the SPARE POOL. When Build Array starts, it will prompt the user to select the target drive. It does this because both drives can still be online. Once the target drive is selected, the rebuild will start.

A drive rebuild can take a long time, depending on the size of the drive. A 2 GB drive takes about two minutes to rebuild when DMA mode is enabled.

Delete Array (F5)

Press the <F5> key to delete a currently configured array. Use the arrow navigation keys to highlight the array you want to delete and then press <F5>.

Use this option with caution. When you delete an array, you lose the array configuration and the data stored in the array.

Restore Old Configuration (F6)

Press the <F6> key to restore the configuration that was in use before you entered the RAID setup utility.

Save and Exit (F10)

When you have completed array configuration, press <F10> to save the configuration and exit the utility. If you do not want to save the configuration or any changes that you have made, press <ESC>. Subsequent message boxes ask for confirmation; respond appropriately. Note that when a new array is configured, its partition record is invalidated.

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Installing Windows NT 4.0 and Windows 2000 Drivers

Use the following procedure to install the IDE Software RAID Windows NT 4.0 or IDE Software RAID Windows 2000 driver on to the RAID-configured drives connected to the primary or secondary IDE channel.

Step	Description
1	Boot the system with the Windows NT or Windows 2000 Boot Installation CD or diskette.
2	Press <F6> when the following message is displayed: "Setup is inspecting your computer hardware configuration."
3	When installation prompts for a key after copying some files, press <S> to add a SCSI adaptor.
4	Select **Other** from the list displayed on-screen.
5	Insert the IDE Software RAID driver floppy diskette and press <ENTER>.
6	Select LSI Logic IDE Software RAID driver from the list and click OK.
7	Continue with the installation process.

Updating the Windows NT 4.0 or Windows 2000 Driver

Use the following procedure to update the IDE Software RAID Windows NT 4.0 or IDE Software RAID Windows 2000 driver or install the IDE Software into an existing system booted from a standard IDE or SCSI drive controller.

Step	Description
1	Click on the Windows **Start** button. The Windows menu is displayed.
2	Select **Settings**.
3	Click on **Control Panel**.

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4	Select **SCSI Adapters**.
5	Select the **Drivers** tab.
6	If the IDE Software RAID is already enabled, it will appear in the list as “LSI CSB6 Controller.” Select and remove it by clicking the **Remove** button.
7	Click the **Add** button.
8	Click the **Have Disk** button. Insert the floppy diskette into the floppy drive.
9	Select Drive A: and click **OK**.
10	Select LSI CSB6 Controller and click **OK**.
11	After Windows copies the driver, reset the system.

Confirming the Windows NT 4.0 or Windows 2000 Driver Installation

Use the following procedure to confirm that the IDE Software RAID Windows NT 4.0 or IDE Software RAID Windows 2000 driver is properly installed.

Step	Description
1	Click on the Windows **Start** button. The Windows menu is displayed.
2	Select **Settings**.
3	Click on **Control Panel**.
4	Select **SCSI Adapters**.
5	Select the **Drivers** tab. If the RAID board is installed, it will appear in the list as “LSI CSB6 Controller.”
6	Select the **Devices** tab. If drives are connected to IDE Software RAID and configured properly, you will see one or more entries as LSI CSB6 #xx under LSI CSB6 Controller.

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IDE Software RAID Configuration Console Installation

The system must have the items listed in the table below before you install the IDE Software RAID Configuration Console. You need to install items for some operating systems before you install the Configuration Console.

Operating System	Service Pack	Internet Browser	Java Runtime Environment (JRE)
Windows NT 4.0	5 or higher	Yes	JRE 1.2 or newer
Windows 2000	No	Not required	JRE1.2 or newer
Red Hat Linux 7.2123	No	Yes	JRE 1.2 or newer

Supported Internet Browsers

IDE Software RAID Configuration Console supports the following browsers:

- Internet Explorer 5.x or newer
- Netscape 4.0 or newer
- Opera 5.2 or newer

Installation Steps for Windows

Insert the CD in your computer and run the Setup.EXE program, using the following directory:

- <CD-ROM Drive Letter>:/Setup.EXE

Setup.EXE installs the required components listed in the above table if they are not already installed. Follow the instructions on the installation screens.

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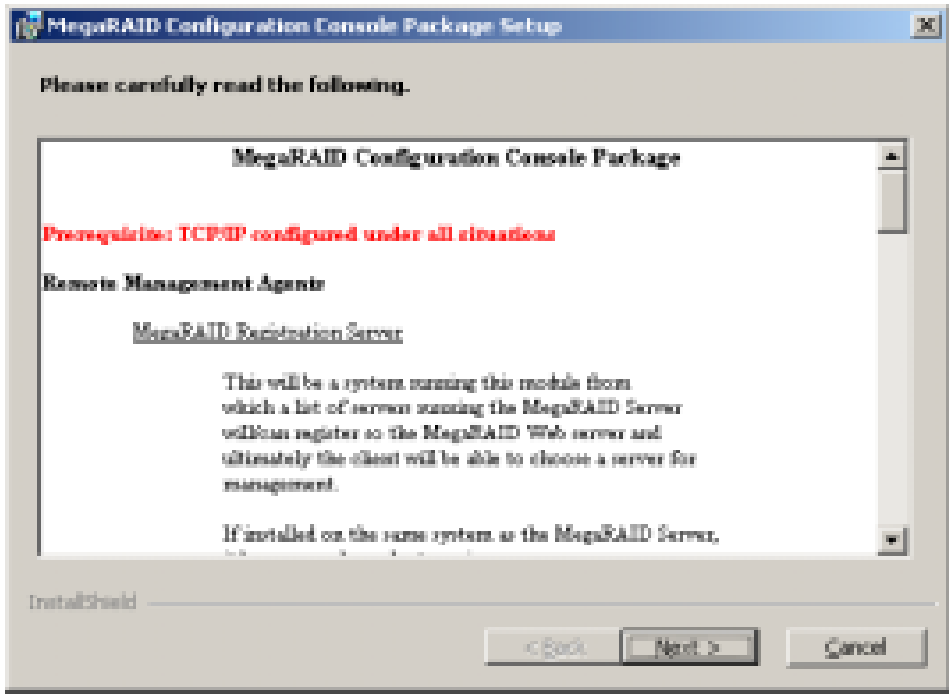

To install MegaRAID Configuration Console software utilities, follow the instructions on the installation screens

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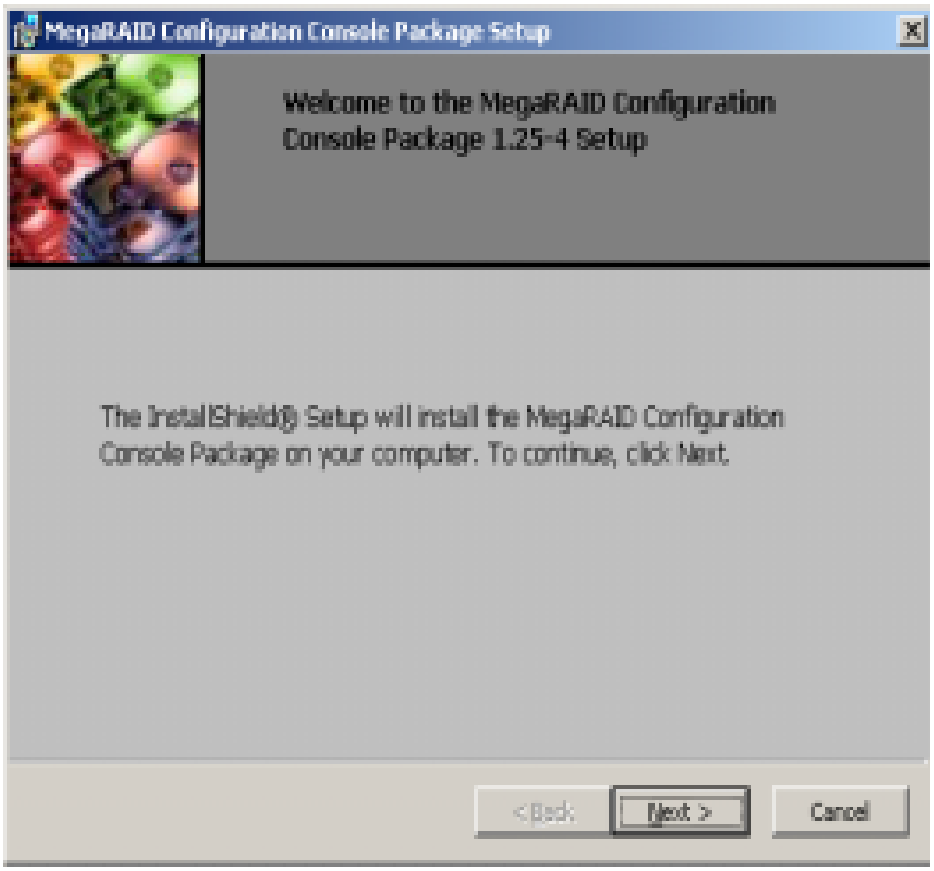
MegaRAID Configuration Console Package Setup
Welcome to the MegaRAID Configuration Console Package 1.25-4 Setup
The InstallShield® Setup will install the MegaRAID Configuration Console Package on your computer. To continue, click Next.
< Back
Next >
Cancel

For local administration of a system with IDE Software RAID, install MegaRAID Web Server and MegaRAID Server. For remote administration of different machines that contain IDE Software RAID, install MegaRAID Web Server, MegaRAID Server, and MegaRAID Registration Server. MegaRAID Registration Server needs to be installed on only one machine in the network.

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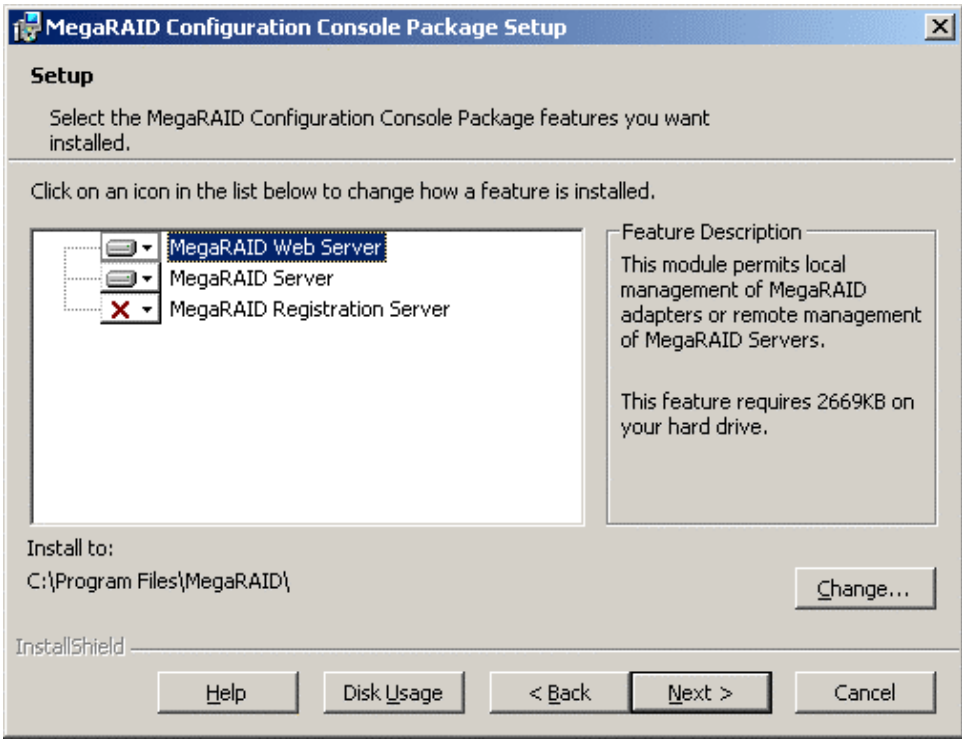
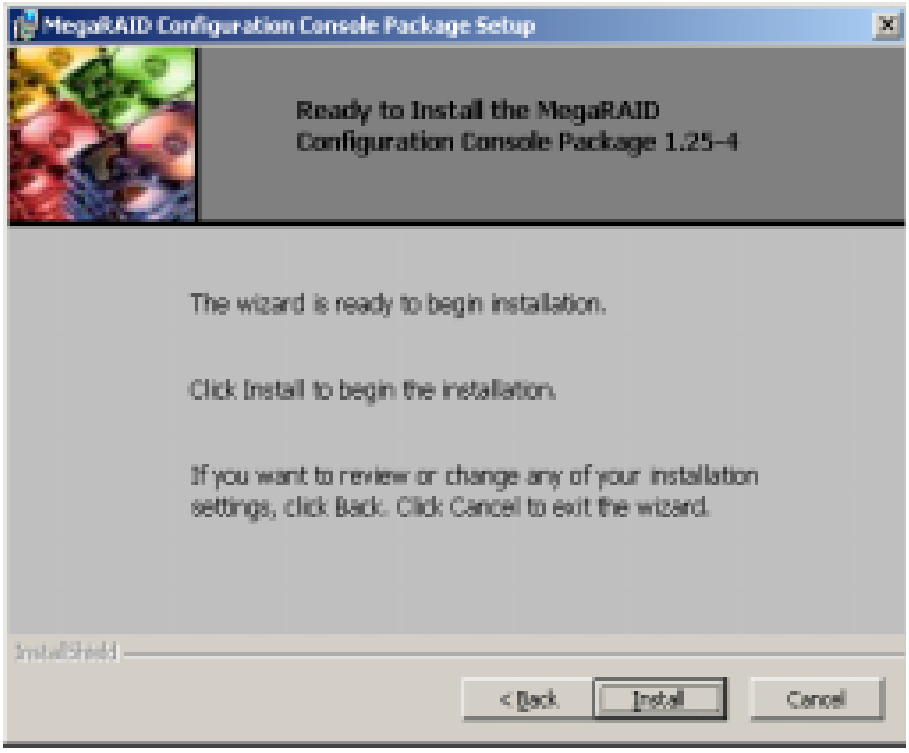

MegaRAID Configuration Console Package Setup
Setup
Select the MegaRAID Configuration Console Package features you want installed.
Click on an icon in the list below to change how a feature is installed.
MegaRAID Web Server
MegaRAID Server
MegaRAID Registration Server
Feature Description
This module permits local management of MegaRAID adapters or remote management of MegaRAID Servers.
This feature requires 2669KB on your hard drive.
Install to:
C:\Program Files\MegaRAID\
Change...
InstallShield
Help
Disk Usage
< Back
Next >
Cancel

Click Install to begin the installation, Back to review or change any installation settings, or Cancel to exit the Wizard.


MegaRAID Configuration Console Package Setup
Ready to Install the MegaRAID Configuration Console Package 1.25-4
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
< Back
Install
Cancel

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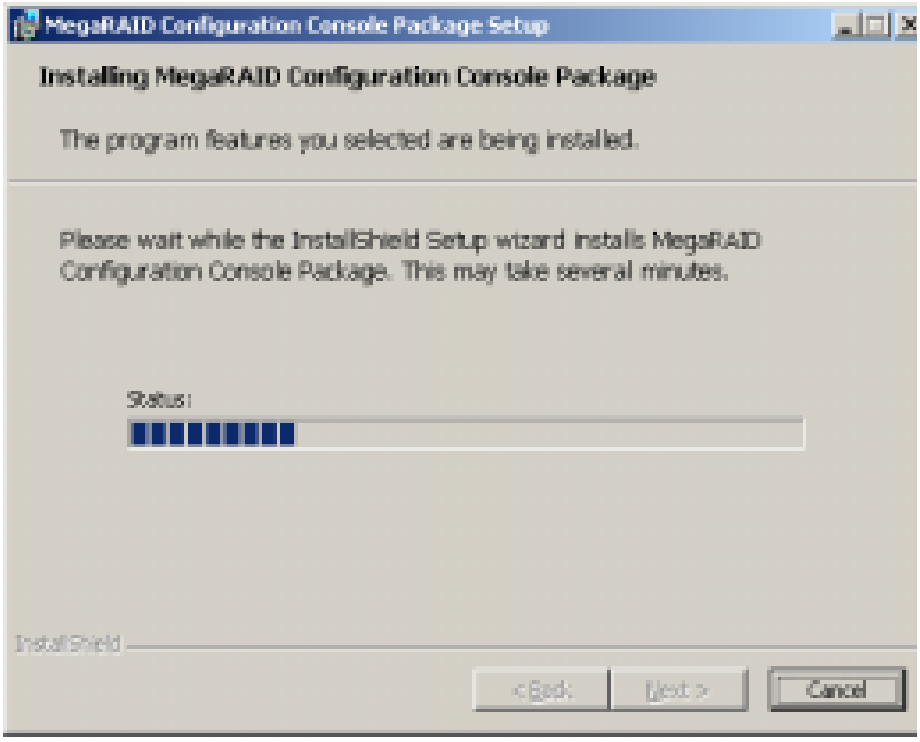
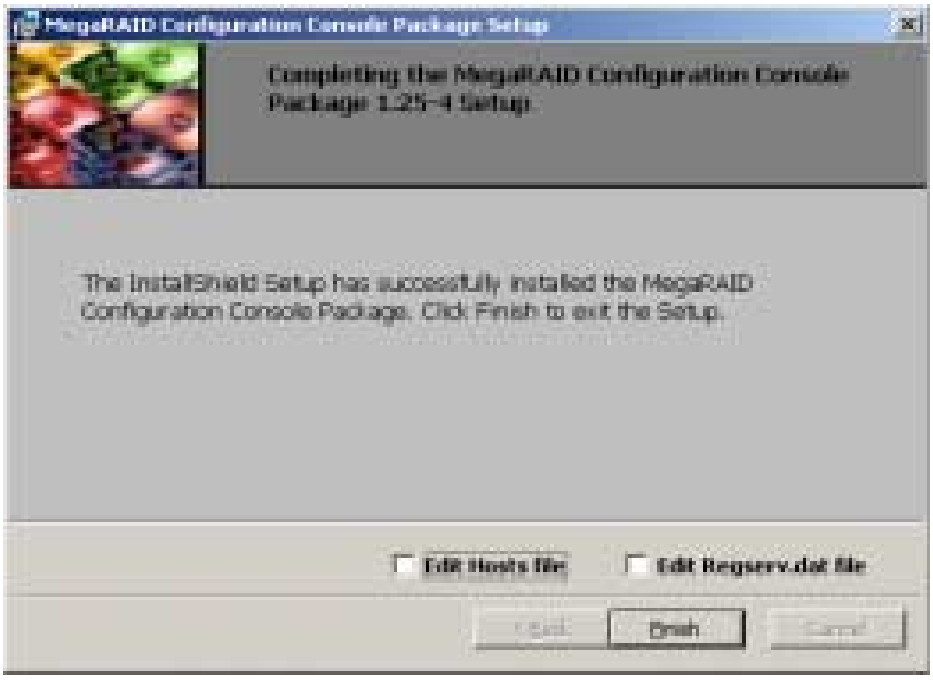
This screen displays the progress of the installation.


MegaRAID Configuration Console Package Setup
Installing MegaRAID Configuration Console Package
The program features you selected are being installed.
Please wait while the InstallShield Setup wizard installs MegaRAID Configuration Console Package. This may take several minutes.
Status:
InstallShield
< Back
Next >
Cancel

Click Finish to complete the installation.


MegaRAID Configuration Console Package Setup
Completing the MegaRAID Configuration Console Package 1.25-4 Setup
The InstallShield Setup has successfully installed the MegaRAID Configuration Console Package. Click Finish to exit the Setup.
Edit Hosts file
Edit Regserv.dat file
Finish

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Using IDE Software RAID Configuration Console

This section describes the IDE Software RAID Configuration Console software utility. You can use the software utilities that come with IDE Software RAID configuration console to perform the following actions.

- Get information about the configuration
- Track the health of the array and physical drives
- Track S.M.A.R.T. status of the physical drives
- Rebuild an array
- Perform a consistency check on an array
- Check error log where all drive failures are reported

IDE Software RAID Configuration Console

To log onto the RAID Server, enter the Internet address in the Internet browser. The following screen displays.

The internet address should be http://localhost:555

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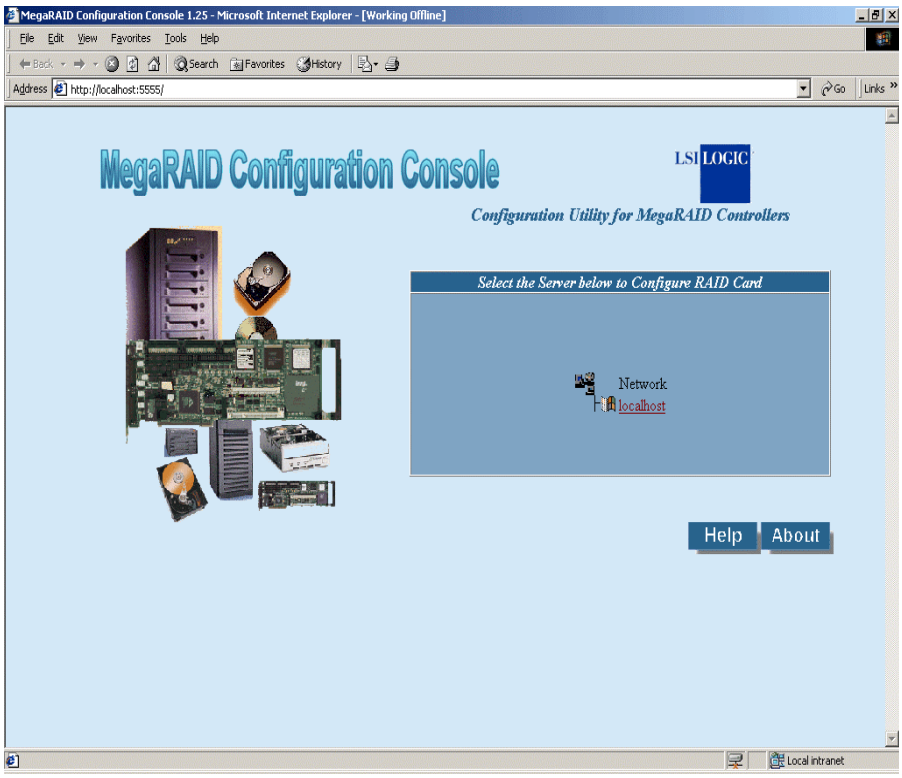

Click the server name to select the RAID Server you want to configure. In the screen above, there is only one server listed.

Continue the log-on procedure by selecting View Only or Full Access in the following screen. The table below describes the access options

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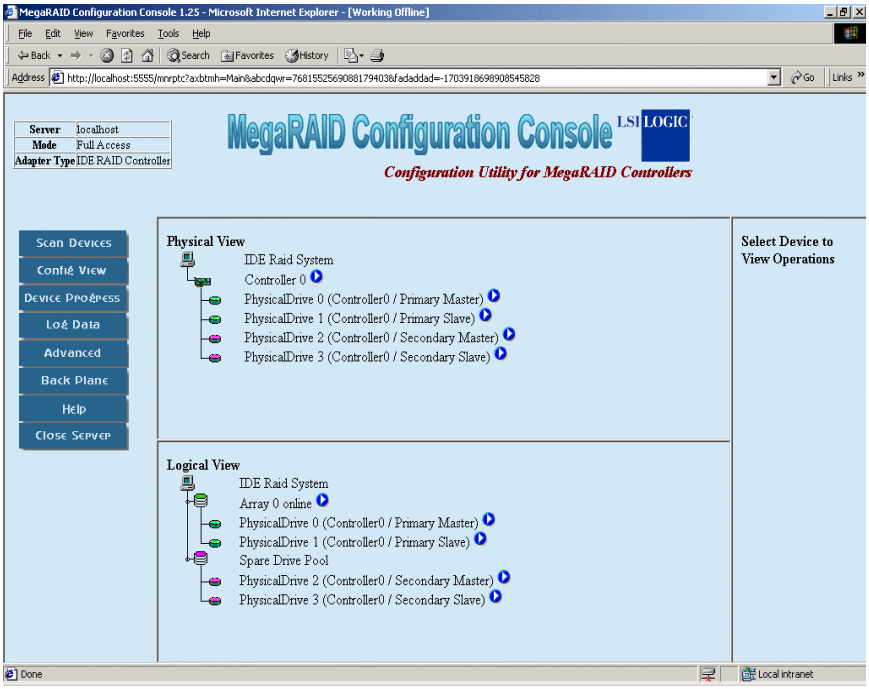

Option	Description
View Only	Allows you to only view the RAID configuration. It does not allow you to perform rebuilds or check consistency.
Full Access	This allows you to view, configure, and manage the IDE Software RAID controller. This option requires you to supply the Full Access Password.

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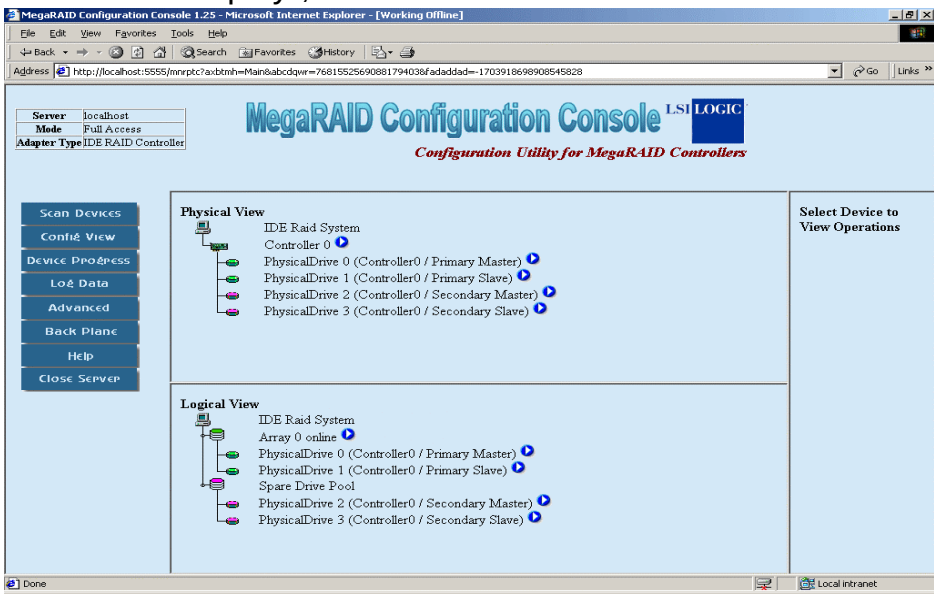
The main screen displays, as shown below.



The following table displays the contents on IDE Software RAID Configuration Console main screen. It is broken up into 5 frames.

Frame	Description
Top	The top frame displays the following information: The server ID that you are logged on to. The mode you are logged on in. The type of RAID controller you are using.
Left	This frame lists the following options (described in the following Table): Scan Devices Configuration View Device Progress Log Data Advanced Back Plane Close Server
Middle Upper	This frame displays the Physical Disk Drive View.
Middle Lower	This frame displays the Logical Disk Drive View.
Right	This frame displays the type of actions you can perform. It also displays extended options and links when certain links are selected.

This table lists the options in the left frame. You can click the options to perform actions or display the related screens.

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Name	Description
Scan Devices	Re scans the system for new hard drives. After you click this button, the driver re scans all PCI devices. You will notice a significant decrease in system performance for a few seconds.
Config View	Displays the RAID configuration, media errors, and status of the drives and arrays. It also allows you to start activity on a particular array. Logical View - displays information about the arrays. Physical View - displays all hard drives attached to the IDE Software RAID controller.
Device Progress	Displays the progress bar for the current activity on the IDE Software RAID controller. The progress bar displays the time left and percentage complete. Possible actions include the following: Rebuild Consistency Check
Log Data	Displays activity log information. All actions add records to the activity log file. The size of this file can be modified by clicking the Advanced button
Advanced	Allows you to modify the parameters for the RAID system.
Back Plane	Some systems can have built-in back plane devices. IDE Software RAID Configuration Console supports several types of back planes. See the user manual for your system.
Close Server	Returns you to the list of available servers.

A small browser window runs in the background as soon as you log on to the RAID Server. It constantly refreshes the view so you have the most current information.

The following screen displays the IDE Software RAID Configuration Console with the Scan Devices button in the left frame selected. When

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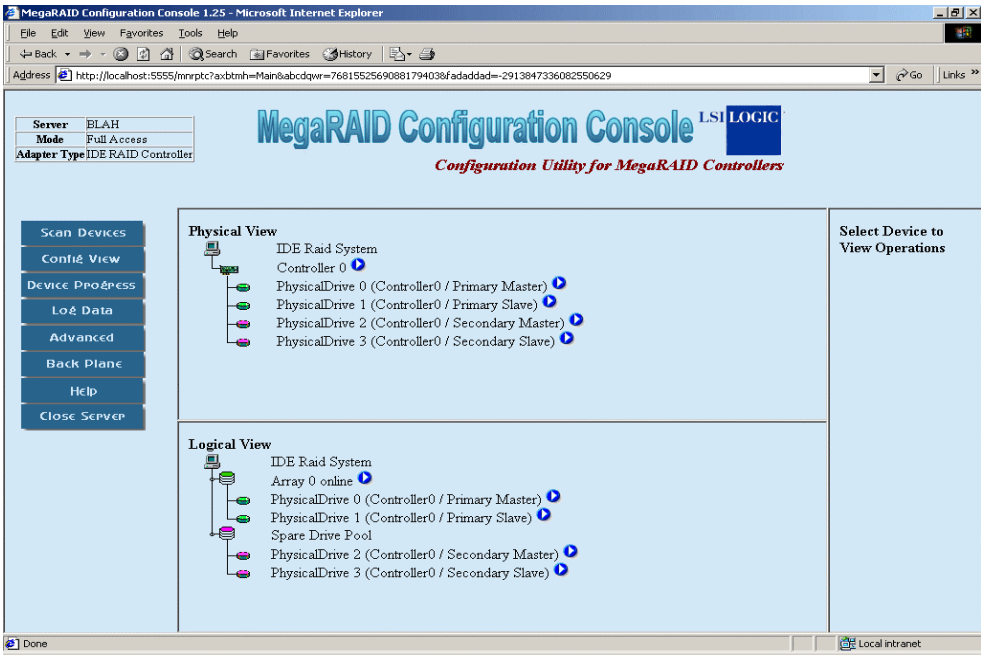
you click Scan Devices, the application re scans for new hard drives. There is a delay while this occurs.



Config View

The following screen displays the IDE Software RAID Configuration Console with the Config View button in the left frame selected. When you click Config View, it displays the RAID configuration, media errors, and status of the drives and arrays. It also allows you to start activity on a particular array.

- Logical View - displays information about the arrays.
- Physical View - displays all hard drives attached to the IDE Software RAID controller.

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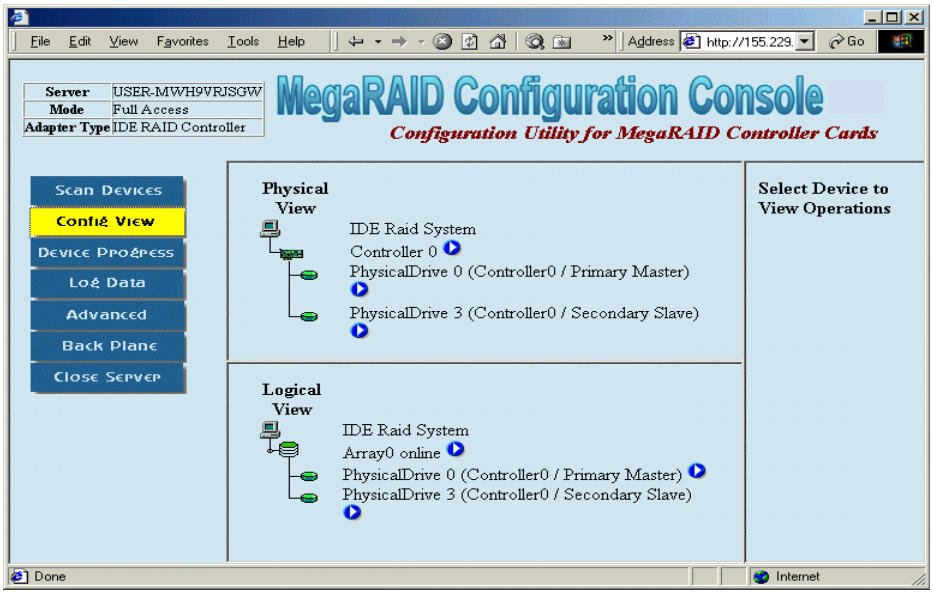
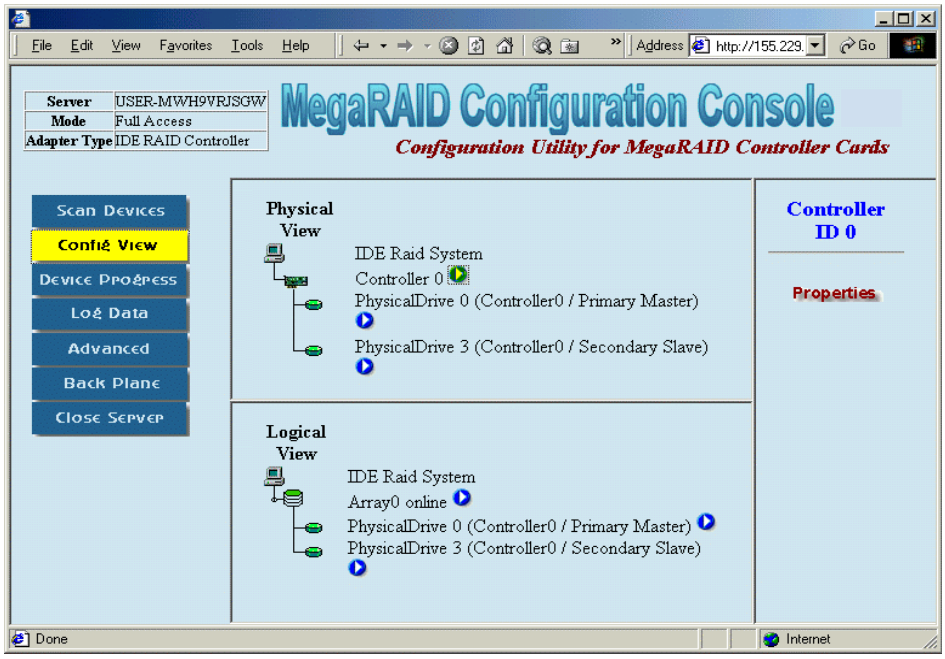


RAID Controller Properties

To view the RAID controller properties, click the button next to the RAID controller.

After you click the button, the RAID controller ID displays in the right frame, and the link to the RAID controller Properties page displays below the controller ID. Click on the word Properties.



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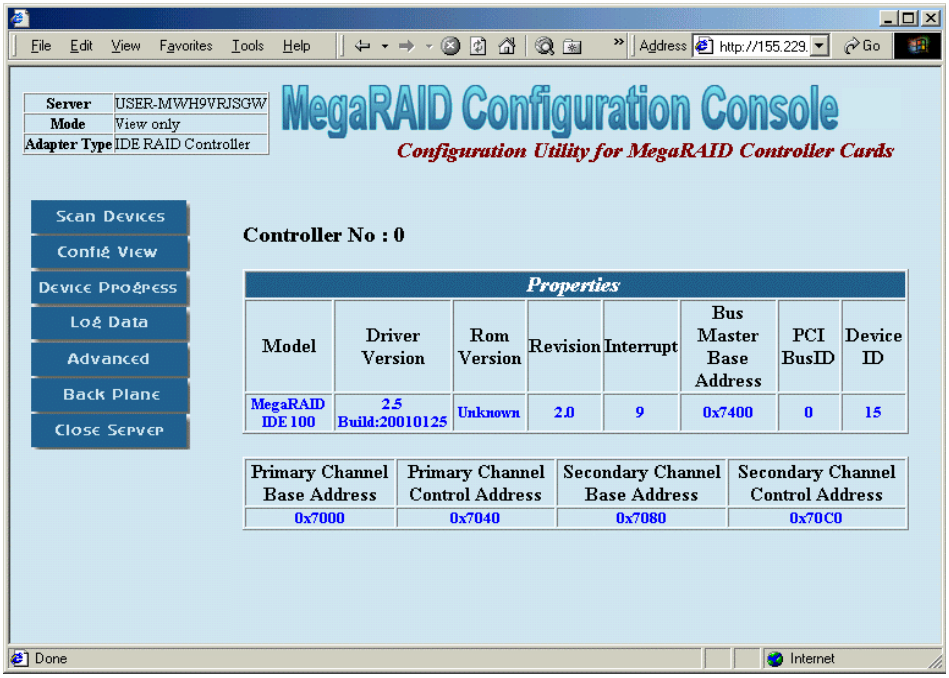
Property Description

This Property Description screen displays the RAID controller properties.



This table provides a description of each field. To exit this screen, click Config View or Scan Devices.

Field	Description
Model	Specifies the model number of the RAID controller.
Driver Version	Specifies the driver version of the RAID controller.
ROM Version	Specifies the ROM version of the RAID controller.
Revision	Specifies the revision of the RAID controller.
Interrupt	Specifies the interrupt of the RAID controller.
Bus Master Base Address	Specifies the Bus Master Base Address of the RAID controller.

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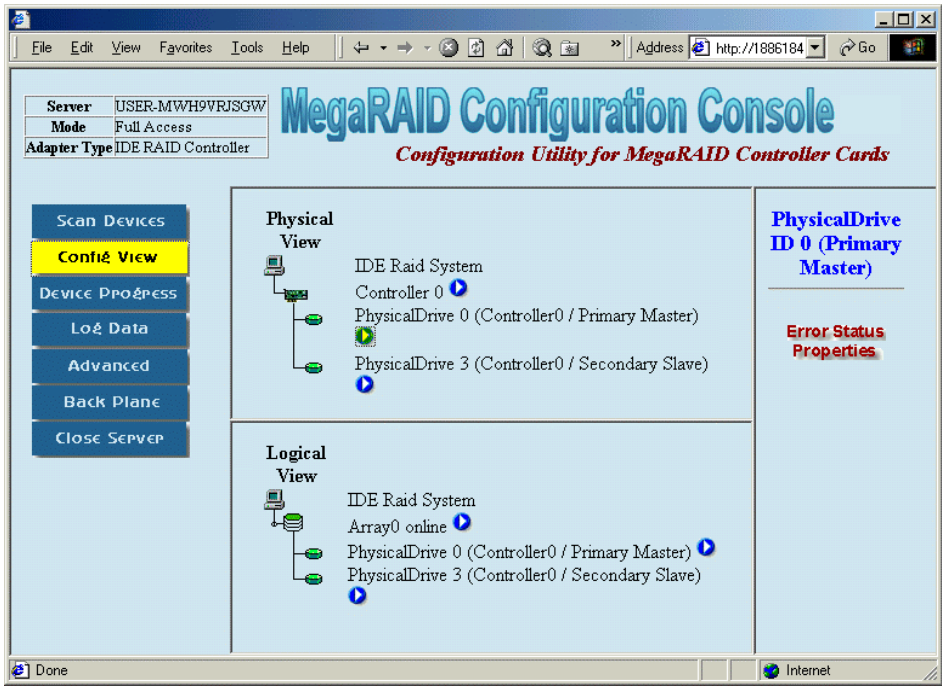
PCI Bus ID	Specifies the PCI Bus ID of the RAID controller.
Device ID	Specifies the Device ID of the RAID controller.
Primary Channel Base Address	Specifies the Primary Channel Base Address of the RAID controller.
Primary Channel Control Address	Specifies the Primary Channel Control Address of the RAID controller.
Secondary Channel Base Address	Specifies the Secondary Channel Base Address of the RAID controller.
Secondary Channel Control Address	Specifies the Secondary Channel Control Address of the RAID controller.

Physical Drive

To view the Physical Drive Properties and Error Status, click the button next to physical drive you want to view.

After you click the button, the Physical Drive ID displays in the right frame. The links to the RAID controller Properties and Error Status page are listed as shown below. Click on the link Properties to display the Physical Drive Properties. Click the Error Status to display the Physical Drives Error Status.



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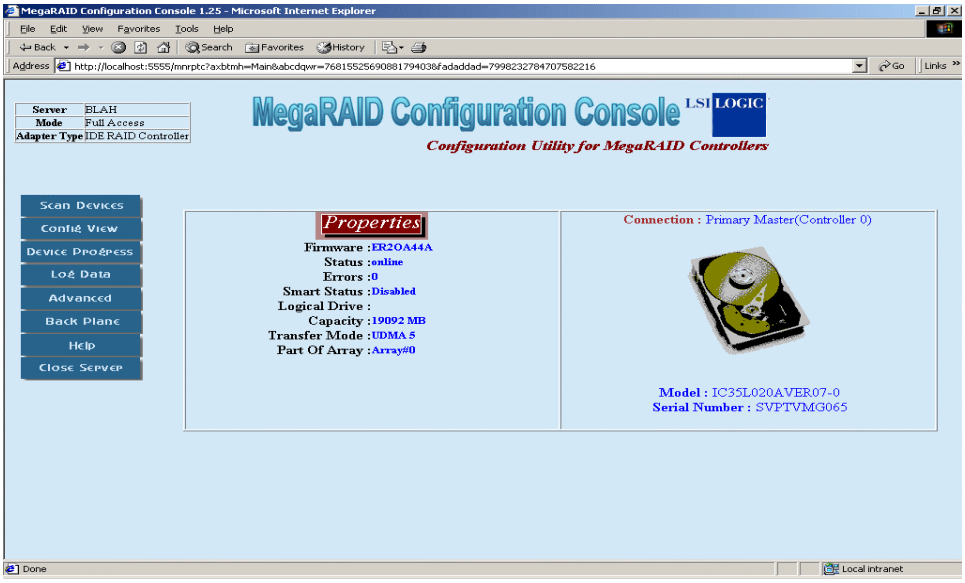
Physical Drive Properties - This screen displays the physical drive properties. The table following provides a description of each field. To exit this page, click on Config View or Scan Devices.



Field	Description
Firmware	Specifies the firmware version of the physical drive.
Status	Specifies gives the status of the physical drive. (online or offline)
Errors	Specifies gives the number of errors in the physical drive.
S.M.A.R.T. Status	Specifies the S.M.A.R.T. (self-monitoring analysis and reporting technology) status of the physical drive. S.M.A.R.T. helps monitor and predict the reliability and performance of the hard drive. The options for this are *Disabled*, *OK*, or *Error*. *Disabled* means S.M.A.R.T. is off and physical drive does not collect statistical data. *OK* means S.M.A.R.T. is on and no errors found. *Error* status means S.M.A.R.T. is on and some errors found; this is a serious warning that means the drive has to be replaced.
Logical Drive	Specifies the logical drive information about this physical drive. (by drive letter or volume)

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Capacity	Specifies the capacity of this physical drive.
Transfer Mode	Specifies the type of transfer mode used on this physical drive.
Part of Array	Specifies the part of the array wo which this physical drive belongs. The RAID mode for a striped array (RAID 0) is called *performance*, and for a mirrored array (RAID 1) is called *reliability*.
Connection	Specifies the type of IDE connection that is used to connect this drive to the RAID controller. (primary or secondary, master or slave)
Model	Specifies the model number of the physical drive.
Serial Number	Specifies the serial number of the physical drive.

Physical Drive Error Status - This screen displays the physical drive error status. This table provides a description of each field.

Field	Description
Time and Date	Specifies the time and date the error was logged.
Error	Specifies the error type.
Sector	Specifies the sector that contains the error.

Physical Drive Errors - Error codes for the physical drives display when you select the error log view. The following table provides a list and descriptions of the error codes.

Code	Description
Error 01	Media read error. The disk surface is damaged.
Error 02	Media write error. The disk surface is damaged.
Error 03	Media verify error.
Error 04	Missing drive type.

Array

To display the Array Properties, perform a Check Consistency, or rebuild the array, click the icon in the lower middle frame next to Array.

After you click the icon, the Array ID displays in the right frame. The links to the Array Properties, Check Consistency, and Rebuild display as

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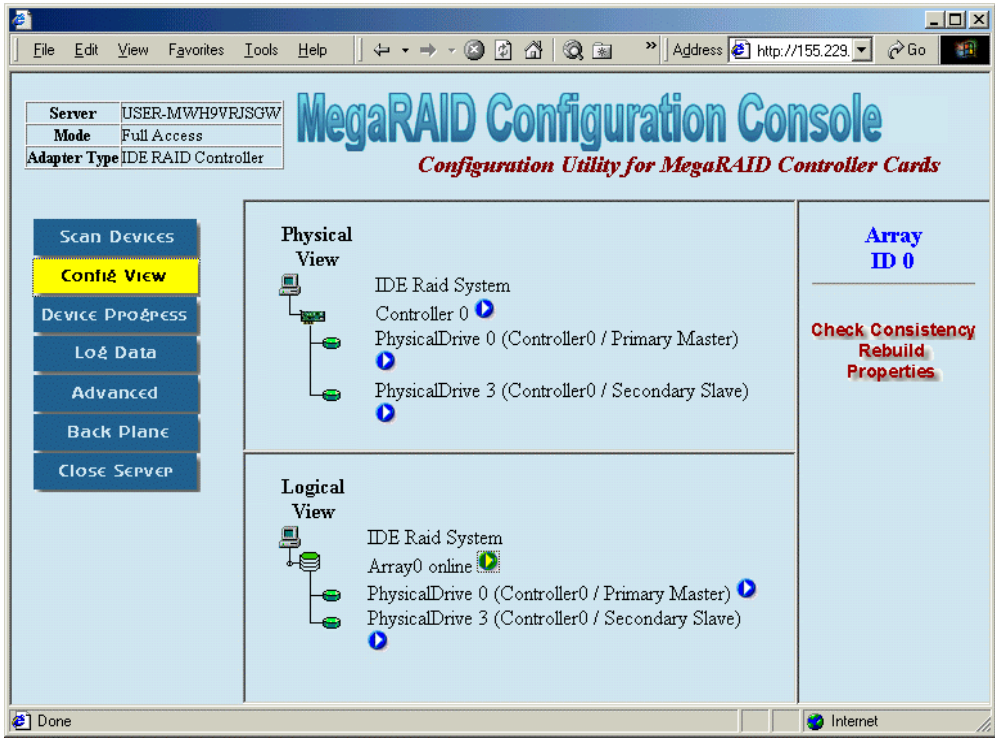
shown in the following screen. Click the word Properties to view the Array Properties. The Array operations are described in the following information.

Due to high resource usage during Rebuild and Consistency Check operations in the Windows operating system, only one action per RAID Server is allowed in Windows.



Array Check Consistency - Click Check Consistency to check the correctness of the redundant data in an array. You can choose to make the data on both drives identical. This function can be performed only on RAID1 and RAID10 arrays.

After you click Check Consistency, the options in this table are displayed in the right frame.

Field	Description
Check All Partitions	Check this option to perform the consistency check on all valid partitions (logical drives). Option is valid only for Windows Raid Servers.

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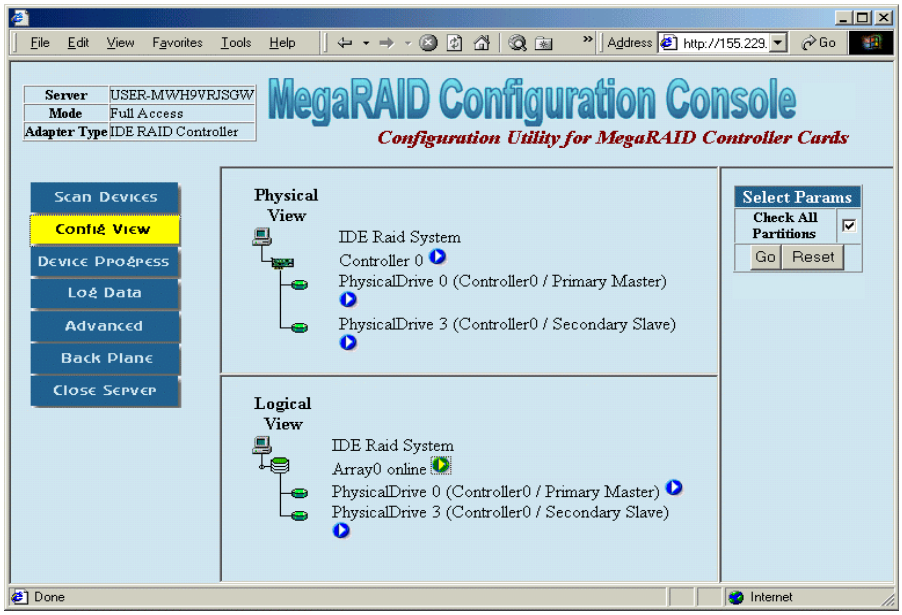
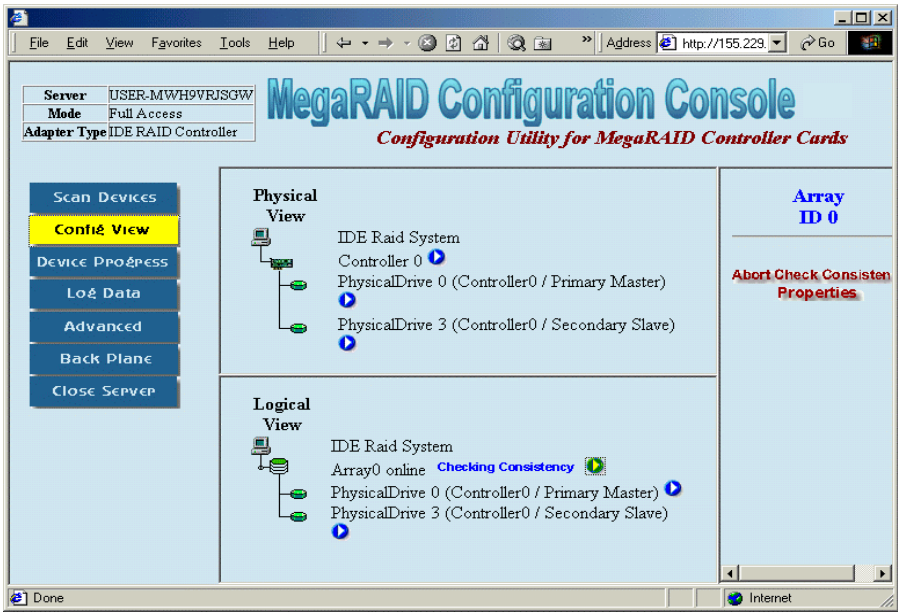


Abort Check Consistency - When the Check Consistency begins, the words Checking Consistency flash next to the array that is being checked. You can abort the Check Consistency by clicking Abort Check Consistency in the right frame. You can view the progress of the Check Consistency by clicking Device Progress in the left frame.



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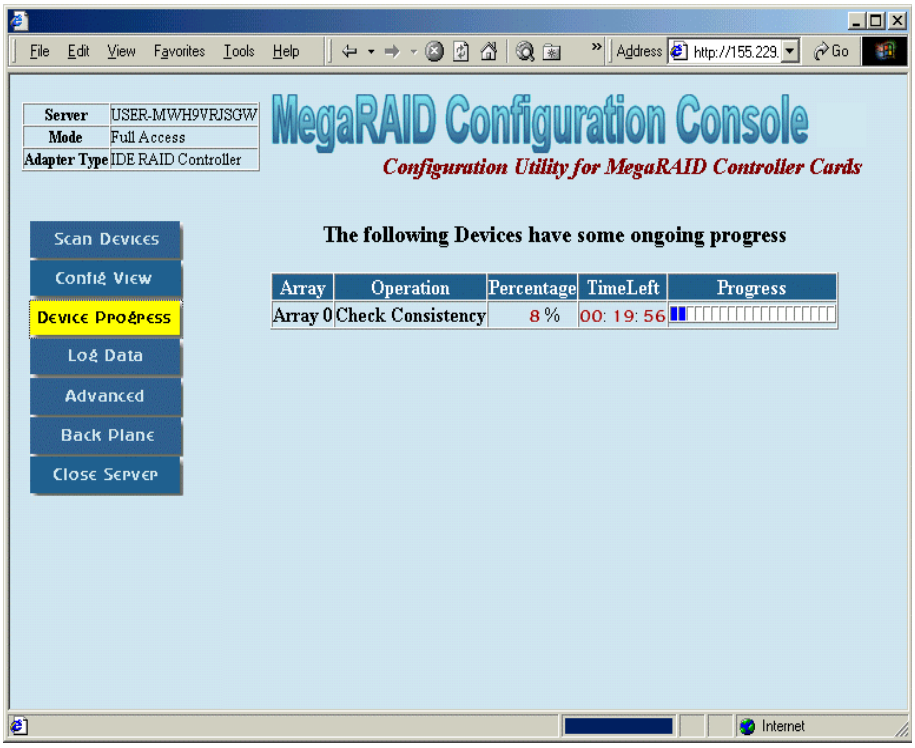
Check Consistency Device Progress -This screen displays the progress of the Check Consistency. The table below provides a description of each field.



Field	Description
Array	Specifies the array number being checked.
Operation	Specifies the type of operation being performed. Example: Check Consistency.
Percentage	Indicates the percentage completed.
Time Left	Indicates the estimated time left to complete the task.
Progress	Displays graphical representation of the progress.

To exit this page, click Config View or Scan Devices.

Array Rebuild Device Progress - This screen displays the Array Rebuild Progress. The table following provides a description of each field.

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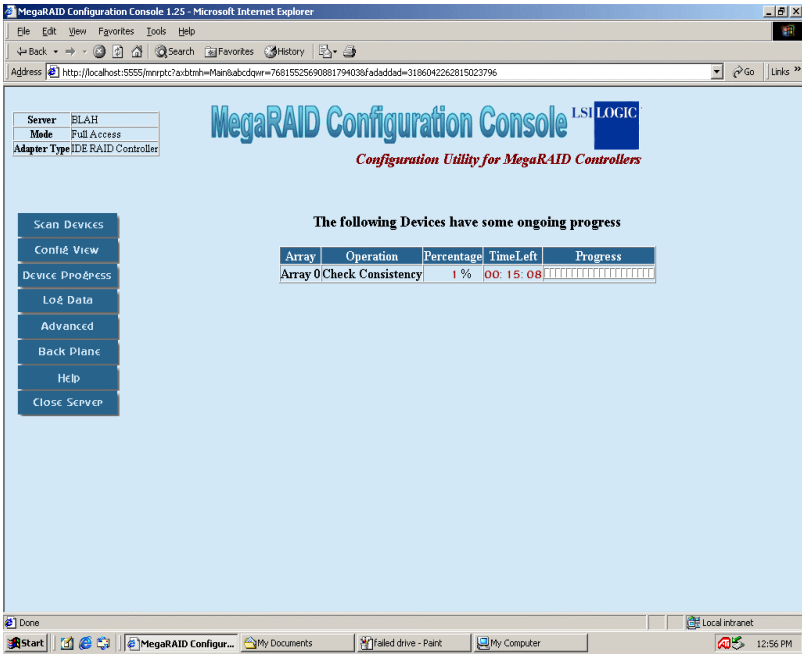

Field	Description
Array	This field gives the array number being rebuilt.
Operation	This field gives the type of operation being performed. Example: Rebuild.
Percentage	This field gives the percentage complete.
Time Left	This field gives the estimated time left to complete the task.
Progress	This gives a graphical representation of the progress.

To exit this page, click on Config View or Scan Devices.

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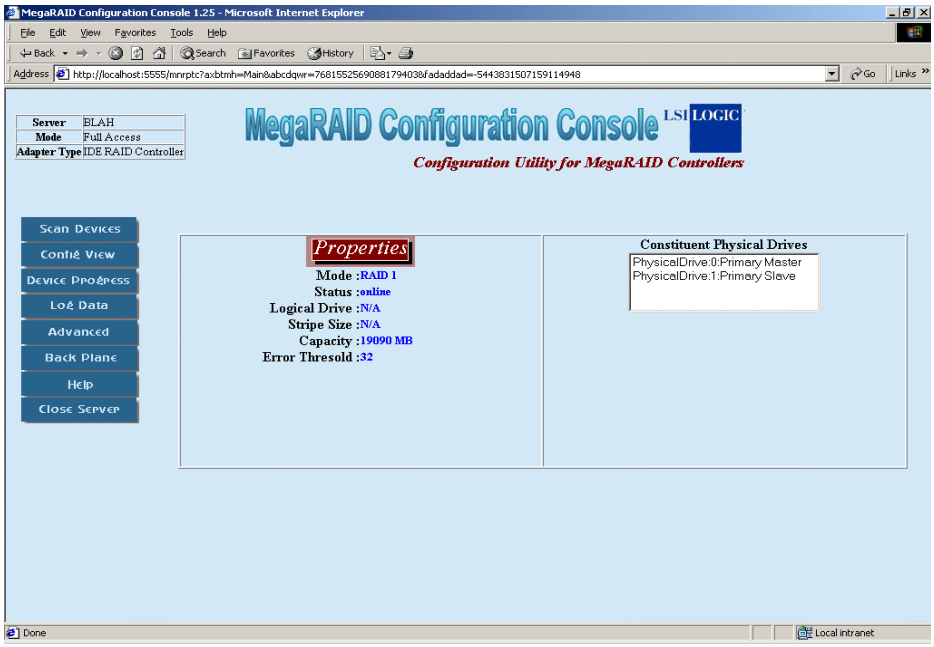
Array Properties - This screen displays the Array Properties. The table below provides a description of each field.



Field	Description
Mode	Displays the IDE Software RAID controller's RAID level. IDE RAID supports RAID 0, 1, and 10.

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Status	Displays the health of the array. The array health status can be one of the following: On Line - Working within normal parameters. Off Line - All drives have failed. Deteriorated - One of the drives has failed.
Logical Drive	Displays the logical drive letters or volume names.
Stripe Size	Displays the stripe size. A stripe size is the minimal amount of data that can be written to the drive in one write. **Note:** RAID level 1 does not have a stripe size parameter. Stripe size parameters are available for RAID level 0 and RAID level 10 array sets only. The stripe size parameter can be set only when the array is created. See the user's guide for your IDE Software RAID IDE controller for more information.
Capacity	Displays the actual size of the array. This size is reported to Operating System.
Error Threshold	This parameter is user defined. Users can define the error threshold on each drive. For more information on how to set the error threshold, see the Advanced menu description.
Constituent Physical Drives	Displays the physical drives joined to an array.

To exit this page, click on Config View or Scan Devices.

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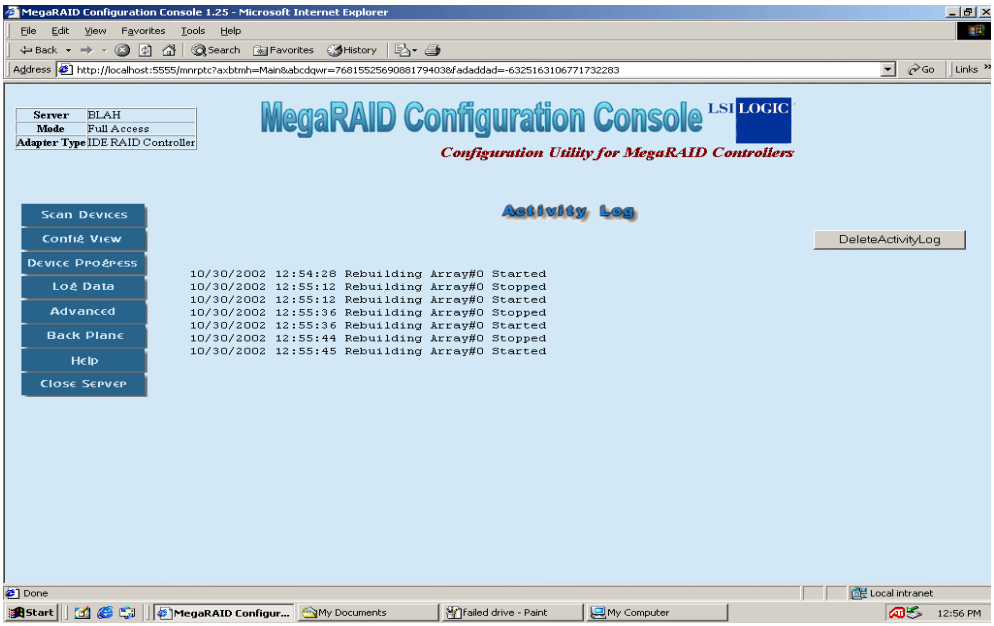
Log Data

This screen displays the Log Data screen. Use the scroll bar to view the log.



To exit this page, click on Config View or Scan Devices.

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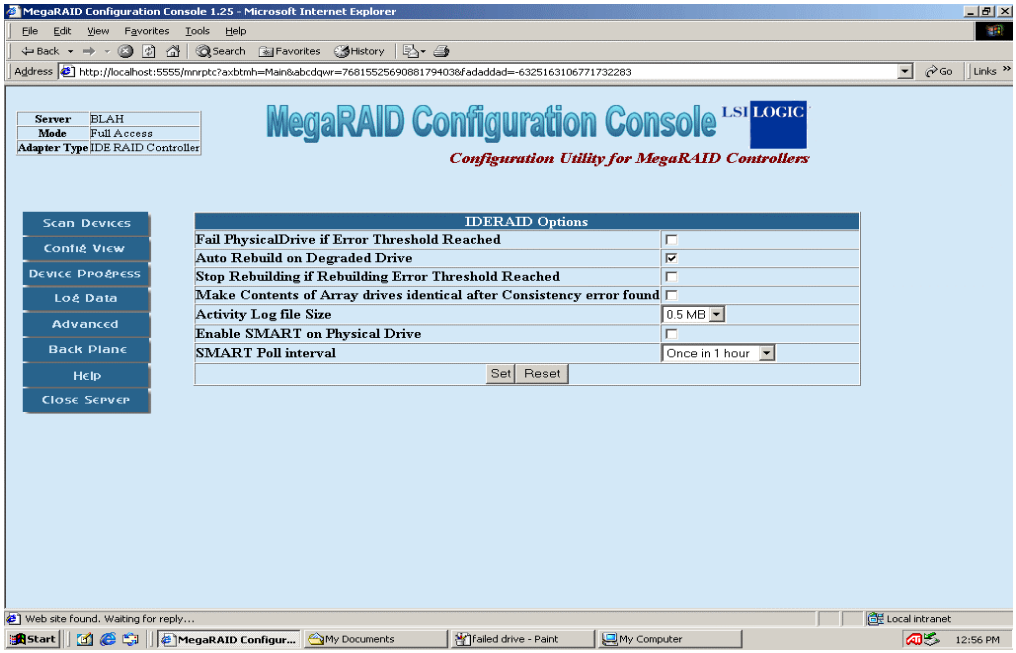
Advanced

This screen displays the Advanced Settings of the IDE Software RAID Configuration Console. The table following provides a description of each field.



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Field	Description
Fail Physical Drive if Error Threshold Reached	Marks drive as Failed when error threshold is reached. After this drive is marked as Failed, it can't be used anymore. Drive status can be changed only from the BIOS Configuration Utility (<Ctrl><M>). This option is not set by default.
Start Rebuilding if Error Threshold Reached	IDE Software RAID Configuration Console begins an automatic rebuild if the array has more than a specified number of errors. If so, it starts an automatic rebuild. * - This option is valid only for arrays set for reliability mode (RAID 1 mirrored arrays).
Check Array for Rebuild at Startup	IDE Software RAID Configuration Console checks the number of errors in the arrays to see if they need rebuilding.
Stop Rebuilding if Rebuilding Error Threshold Reached	If the maximum number of errors allowed is found in an array during rebuild, IDE Software RAID Configuration Console will stop the rebuild.
Make Contents of Array Drives Identical after Check Consistency error found	If IDE Software RAID Configuration Console finds mismatches between two mirrored (RAID 1) arrays, it will copy the data from one drive to the other to make them identical. * - This option is valid only for arrays set for reliability mode (RAID 1 mirrored arrays).
Delete Activity Log Files when it reaches maximum Allowed Size	This deletes the activity log file if it reaches the maximum allowable size (as set in the box below this item). If checked, the activity log file is overwritten when it reaches the maximum size. If not checked, the file stops updating when it reaches the maximum size and is not updated anymore.
Activity Log File Size	Use this box to select the maximum size for the activity log file.
Enable S.M.A.R.T. on Physical Drive	If this option is checked, it enables S.M.A.R.T. monitoring of all physical drives attached to the RAID controller.
S.M.A.R.T. Poll Interval	This setting allows you to set the time interval that S.M.A.R.T. status is checked.

S.M.A.R.T. stands for self-monitoring, analysis, and reporting technology. This feature is built into the hard drive that checks for potential problems that can crash the hard drive. Not all hard drives have this feature.

To exit this page, click on Config View or Scan Devices.

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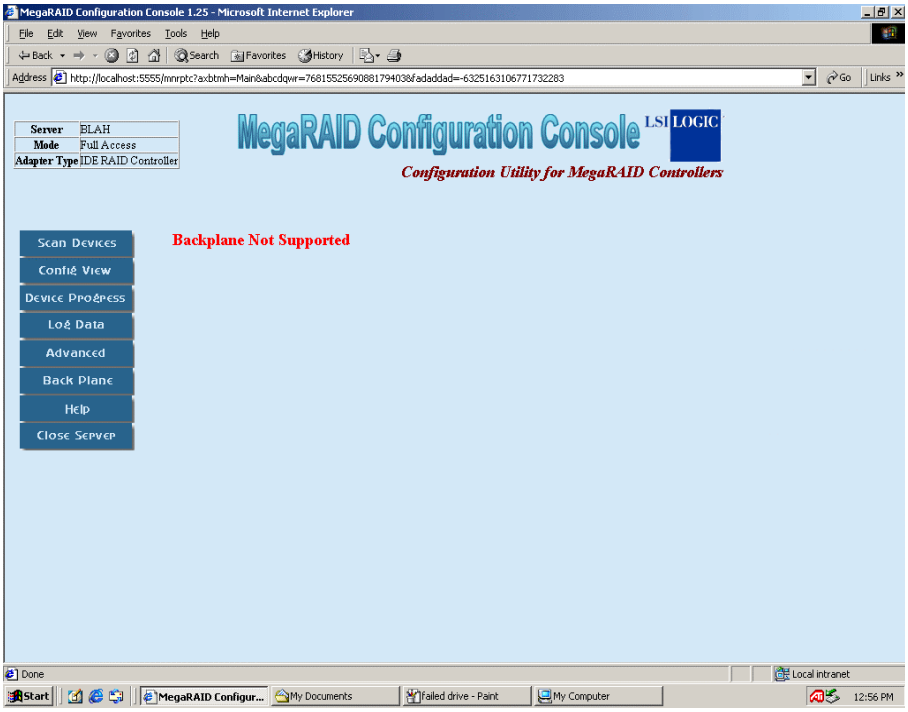
Backplane

This screen displays the backplane information of the RAID array. Different backplanes can have different features. This application shows the following:

- Current temperature inside the backplane
- Error log
- Fan speed



To exit this page, click Config View or Scan Devices.

Close Server

To exit this RAID server, click Close Server in the left frame.

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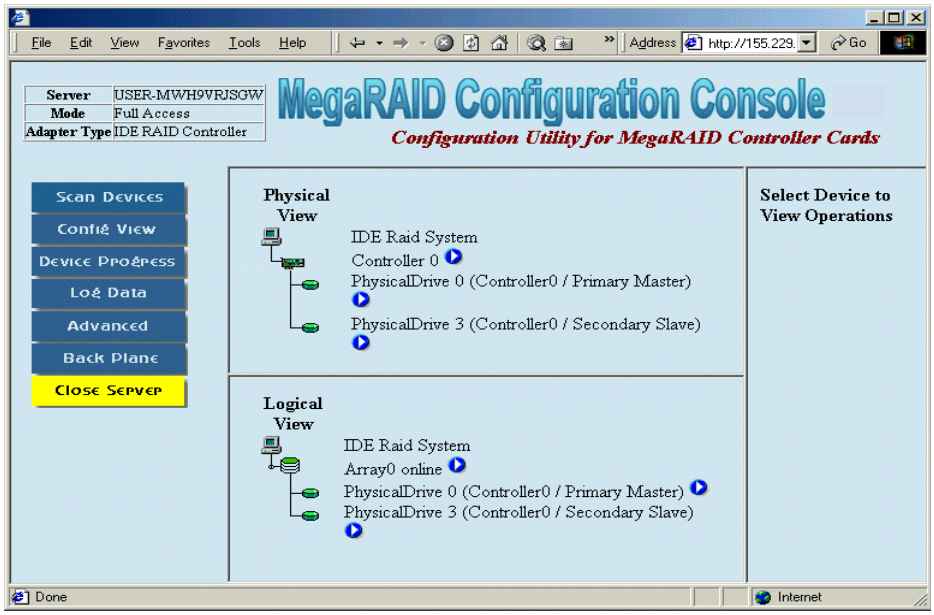

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Appendix A: AMIBIOS POST Checkpoint Codes

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AMIBIOS POST Checkpoint Codes

Uncompressed Initialization Codes

The uncompressed initialization checkpoint codes are listed in order of execution:

Checkpoint Code	Description
D0h	The NMI is disabled. Power on delay is starting. Next, the initialization code checksum will be verified.
D1h	Initializing the DMA controller, performing the keyboard controller BAT test, starting memory refresh, and entering 4 GB flat mode next.
D3h	Starting memory sizing next.
D4h	Returning to real mode. Executing any OEM patches and setting the stack next.
D5h	Passing control to the uncompressed code in shadow RAM at E000:0000h. The initialization code is copied to segment 0 and control will be transferred to segment 0.
D6h	Control is in segment 0. Next, checking if <Ctrl> <Home> was pressed and verifying the system BIOS checksum. If either **<Ctrl> <Home>** was pressed or the system BIOS checksum is bad, next will go to checkpoint code E0h. Otherwise, going to checkpoint code D7h.

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POST Checkpoint Codes

Bootblock Recovery Codes

The bootblock recovery checkpoint codes are listed in order of execution:

Checkpoint Code	Description
E0h	The onboard floppy controller if available is initialized. Next, beginning the base 512 KB memory test.
E1h	Initializing the interrupt vector table next.
E2h	Initializing the DMA and Interrupt controllers next.
E6h	Enabling the floppy drive controller and Timer IRQs. Enabling internal cache memory.
Edh	Initializing the floppy drive.
Eeh	Looking for a floppy diskette in drive A:. Reading the first sector of the diskette.
Efh	A read error occurred while reading the floppy drive in drive A:.
F0h	Next, searching for the AMIBOOT.ROM file in the root directory.
F1h	The AMIBOOT.ROM file is not in the root directory.
F2h	Next, reading and analyzing the floppy diskette FAT to find the clusters occupied by the AMIBOOT.ROM file.
F3h	Next, reading the AMIBOOT.ROM file, cluster by cluster.
F4h	The AMIBOOT.ROM file is not the correct size.
F5h	Next, disabling internal cache memory.
FBh	Next, detecting the type of flash ROM.

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Checkpoint Code	Description
FCh	Next, erasing the flash ROM.
FDh	Next, programming the flash ROM.
FFh	Flash ROM programming was successful. Next, restarting the system BIOS.

Uncompressed Initialization Codes

The following runtime checkpoint codes are listed in order of execution. These codes are uncompressed in F0000h shadow RAM.

Checkpoint Code	Description
03h	The NMI is disabled. Next, checking for a soft reset or a power on condition.
05h	The BIOS stack has been built. Next, disabling cache memory.
06h	Uncompressing the POST code next.
07h	Next, initializing the CPU and the CPU data area.
08h	The CMOS checksum calculation is done next.
0Ah	The CMOS checksum calculation is done. Initializing the CMOS status register for date and time next.
0Bh	The CMOS status register is initialized. Next, performing any required initialization before the keyboard BAT command is issued.
0Ch	The keyboard controller input buffer is free. Next, issuing the BAT command to the keyboard controller.

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Checkpoint Code	Description
0Eh	The keyboard controller BAT command result has been verified. Next, performing any necessary initialization after the keyboard controller BAT command test.
0Fh	The initialization after the keyboard controller BAT command test is done. The keyboard command byte is written next.
10h	The keyboard controller command byte is written. Next, issuing the Pin 23 and 24 blocking and unblocking command.
11h	Next, checking if **<End>** or **<Ins>** keys were pressed during power on. Initializing CMOS RAM if the *Initialize CMOS RAM in every boot* AMIBIOS POST option was set in AMIBCP or the **<End>** key was pressed.
12h	Next, disabling DMA controllers 1 and 2 and interrupt controllers 1 and 2.
13h	The video display has been disabled. Port B has been initialized. Next, initializing the chipset.
14h	The 8254 timer test will begin next.
19h	The 8254 timer test is over. Starting the memory refresh test next.
1Ah	The memory refresh line is toggling. Checking the 15 second on/off time next.
23h	Reading the 8042 input port and disabling the MEGAKEY Green PC feature next. Making the BIOS code segment writable and performing any necessary configuration before initializing the interrupt vectors.
24h	The configuration required before interrupt vector initialization has completed. Interrupt vector initialization is about to begin.

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Checkpoint Code	Description
25h	Interrupt vector initialization is done. Clearing the password if the POST DIAG switch is on.
27h	Any initialization before setting video mode will be done next.
28h	Initialization before setting the video mode is complete. Configuring the monochrome mode and color mode settings next.
2Ah	Bus initialization system, static, output devices will be done next, if present. See page 131 for additional information.
2Bh	Passing control to the video ROM to perform any required configuration before the video ROM test.
2Ch	All necessary processing before passing control to the video ROM is done. Looking for the video ROM next and passing control to it.
2Dh	The video ROM has returned control to BIOS POST. Performing any required processing after the video ROM had control.
2Eh	Completed post-video ROM test processing. If the EGA/VGA controller is not found, performing the display memory read/write test next.
2Fh	The EGA/VGA controller was not found. The display memory read/write test is about to begin.
30h	The display memory read/write test passed. Look for retrace checking next.
31h	The display memory read/write test or retrace checking failed. Performing the alternate display memory read/write test next.
32h	The alternate display memory read/write test passed. Looking for alternate display retrace checking next.
34h	Video display checking is over. Setting the display mode next.

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Checkpoint Code	Description
37h	The display mode is set. Displaying the power on message next.
38h	Initializing the bus input, IPL, general devices next, if present. See page 131 for additional information.
39h	Displaying bus initialization error messages. See page 131 for additional information.
3Ah	The new cursor position has been read and saved. Displaying the Hit **<DEL>** message next.
3Bh	The Hit **<DEL>** message is displayed. The protected mode memory test is about to start.
40h	Preparing the descriptor tables next.
42h	The descriptor tables are prepared. Entering protected mode for the memory test next.
43h	Entered protected mode. Enabling interrupts for diagnostics mode next.
44h	Interrupts enabled if the diagnostics switch is on. Initializing data to check memory wraparound at 0:0 next.
45h	Data initialized. Checking for memory wraparound at 0:0 and finding the total system memory size next.
46h	The memory wraparound test is done. Memory size calculation has been done. Writing patterns to test memory next.
47h	The memory pattern has been written to extended memory. Writing patterns to the base 640 KB memory next.
48h	Patterns written in base memory. Determining the amount of memory below 1 MB next.

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Checkpoint Code	Description
49h	The amount of memory below 1 MB has been found and verified. Determining the amount of memory above 1 MB memory next.
4Bh	The amount of memory above 1 MB has been found and verified. Checking for a soft reset and clearing the memory below 1 MB for the soft reset next. If this is a power on situation, going to checkpoint 4Eh next.
4Ch	The memory below 1 MB has been cleared via a soft reset. Clearing the memory above 1 MB next.
4Dh	The memory above 1 MB has been cleared via a soft reset. Saving the memory size next. Going to checkpoint 52h next.
4Eh	The memory test started, but not as the result of a soft reset. Displaying the first 64 KB memory size next.
4Fh	The memory size display has started. The display is updated during the memory test. Performing the sequential and random memory test next.
50h	The memory below 1 MB has been tested and initialized. Adjusting the displayed memory size for relocation and shadowing next.
51h	The memory size display was adjusted for relocation and shadowing. Testing the memory above 1 MB next.
52h	The memory above 1 MB has been tested and initialized. Saving the memory size information next.
53h	The memory size information and the CPU registers are saved. Entering real mode next.
54h	Shutdown was successful. The CPU is in real mode. Disabling the Gate A20 line, parity, and the NMI next.

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Checkpoint Code	Description
57h	The A20 address line, parity, and the NMI are disabled. Adjusting the memory size depending on relocation and shadowing next.
58h	The memory size was adjusted for relocation and shadowing. Clearing the Hit **<DEL>** message next.
59h	The Hit **<DEL>** message is cleared. The **<WAIT...>** message is displayed. Starting the DMA and interrupt controller test next.
60h	The DMA page register test passed. Performing the DMA Controller 1 base register test next.
62h	The DMA controller 1 base register test passed. Performing the DMA controller 2 base register test next.
65h	The DMA controller 2 base register test passed. Programming DMA controllers 1 and 2 next.
66h	Completed programming DMA controllers 1 and 2. Initializing the 8259 interrupt controller next.
67h	Completed 8259 interrupt controller initialization.
7Fh	Extended NMI source enabling is in progress.
80h	The keyboard test has started. Clearing the output buffer and checking for stuck keys. Issuing the keyboard reset command next.
81h	A keyboard reset error or stuck key was found. Issuing the keyboard controller interface test command next.
82h	The keyboard controller interface test completed. Writing the command byte and initializing the circular buffer next.
83h	The command byte was written and global data initialization has completed. Checking for a locked key next.

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Checkpoint Code	Description
84h	Locked key checking is over. Checking for a memory size mismatch with CMOS RAM data next.
85h	The memory size check is done. Displaying a soft error and checking for a password or bypassing WINBIOS Setup next.
86h	The password was checked. Performing any required programming before WINBIOS Setup next.
87h	The programming before WINBIOS Setup has completed. Uncompressing the WINBIOS Setup code and executing the AMIBIOS Setup or WINBIOS Setup utility next.
88h	Returned from WINBIOS Setup and cleared the screen. Performing any necessary programming after WINBIOS Setup next.
89h	The programming after WINBIOS Setup has completed. Displaying the power on screen message next.
8Bh	The first screen message has been displayed. The **<WAIT...>** message is displayed. Performing the PS/2 mouse check and extended BIOS data area allocation check next.
8Ch	Programming the WINBIOS Setup options next.
8Dh	The WINBIOS Setup options are programmed. Resetting the hard disk controller next.
8Fh	The hard disk controller has been reset. Configuring the floppy drive controller next.
91h	The floppy drive controller has been configured. Configuring the hard disk drive controller next.
95h	Initializing the bus option ROMs from C800 next. See page 131 for additional information.
96h	Initializing before passing control to the adaptor ROM at C800.

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Checkpoint Code	Description
97h	Initialization before the C800 adaptor ROM gains control has completed. The adaptor ROM check is next.
98h	The adaptor ROM had control and has now returned control to BIOS POST. Performing any required processing after the option ROM returned control.
99h	Any initialization required after the option ROM test has completed. Configuring the timer data area and printer base address next.
9Ah	Set the timer and printer base addresses. Setting the RS-232 base address next.
9Bh	Returned after setting the RS-232 base address. Performing any required initialization before the Coprocessor test next.
9Ch	Required initialization before the Coprocessor test is over. Initializing the Coprocessor next.
9Dh	Coprocessor initialized. Performing any required initialization after the Coprocessor test next.
9Eh	Initialization after the Coprocessor test is complete. Checking the extended keyboard, keyboard ID, and Num Lock key next. Issuing the keyboard ID command next.
A2h	Displaying any soft errors next.
A3h	The soft error display has completed. Setting the keyboard typematic rate next.
A4h	The keyboard typematic rate is set. Programming the memory wait states next.
A5h	Memory wait state programming is over. Clearing the screen and enabling parity and the NMI next.
A7h	NMI and parity enabled. Performing any initialization required before passing control to the adaptor ROM at E000 next.

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Checkpoint Code	Description
A8h	Initialization before passing control to the adaptor ROM at E000h completed. Passing control to the adaptor ROM at E000h next.
A9h	Returned from adaptor ROM at E000h control. Performing any initialization required after the E000 option ROM had control next.
Aah	Initialization after E000 option ROM control has completed. Displaying the system configuration next.
Abh	Uncompressing the DMI data and executing DMI POST initialization next.
B0h	The system configuration is displayed.
B1h	Copying any code to specific areas.
00h	Code copying to specific areas is done. Passing control to INT 19h boot loader next.

Bus Checkpoint Codes

The system BIOS passes control to different buses at the following checkpoints:

Checkpoint Code	Description
2Ah	Initializing the different bus system, static, and output devices, if present.
38h	Initialized bus input, IPL, and general devices, if present.
39h	Displaying bus initialization error messages, if any.
95h	Initializing bus adaptor ROMs from C8000h through D8000h.

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Additional Bus Checkpoints

While control is inside the different bus routines, additional checkpoints are output to I/O port address 0080h as word to identify the routines being executed.

These are word checkpoints. The low byte of checkpoint is the system BIOS checkpoint where control is passed to the different bus routines.

The high byte of checkpoint indicates that the routine is being executed in different buses.

High Byte

The high byte of these checkpoints includes the following information:

Bits	Description
Bits 7-4	0000 Function 0. Disable all devices on the bus. 0001 Function 1. Initialize static devices on the bus. 0010 Function 2. Initialize output devices on the bus. 0011 Function 3. Initialize input devices on the bus. 0100 Function 4. Initialize IPL devices on the bus. 0101 Function 5. Initiate general devices on the bus. 0110 Function 6. Initialize error reporting on the bus. 0111 Function 7. Initialize add-on ROMs for all buses.
Bits 3-0	Specify the bus 0 Generic DIM Device Initialization Manager. 1 Onboard System devices. 2 ISA devices. 3 EISA devices. 4 ISA PnP devices. 5 PCI devices.

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Appendix B: ASM quick installation guide

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This appendix shows you how to install the ASM software package.

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Installing ASM

Acer Server Manager (ASM) consists of the ASM Console and the ASM Agent. These two components are both required to perform server management tasks.

System requirements

ASM requires TCP/IP connectivity between the ASM Console and the ASM Agent.

ASM Agent

- 128 MB of RAM
- SCSI/IDE hard drive with at least 100 MB free hard disk space
- Microsoft Windows NT 4.0 or Windows 2000 Server/Advanced Server operating system

ASM Console

- Intel Pentium III (500 MHz) or higher processor
- 128 MB of RAM
- SCSI/IDE hard drive with at least 100 MB free hard disk space
- Microsoft Windows 2000 Professional/XP/Server/Advanced Server operating system
- Ethernet card

System setup

Make sure that your system meets the requirements listed above before proceeding. You may also want to change your screen to 800 x 600 resolution or higher for optimum viewing.

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Installing ASM Agent

To install ASM Agent:

1 Log in to the managed server using the Administrator account.

2 Insert the EasyBUILD™ Management CD into the server's CD-ROM drive.

The installation sequence will automatically be displayed.

3 Select the option for ASM installation.

The installation wizard will be initialized.

4 Follow all onscreen instructions to complete installation.

For detailed instructions on installing ASM Agent, refer to the ASM User's manual.

To launch the program, on the Windows taskbar click on the **Start** button, point to **Programs**, select **Acer Server Management Suite** then click **ASM Agent**.

Installing ASM Console

To install ASM Console:

1 Log in to the target Windows-based PC using the Administrator account.

2 Insert the EasyBUILD™ Management CD into the computer's CD-ROM drive.

The installation sequence will automatically be displayed.

3 Select the option for ASM installation.

The installation wizard will be initialized.

4 Follow all onscreen instructions to complete installation.

For detailed instructions on installing ASM Console, refer to the ASM User's manual.

To launch the program, on the Windows taskbar click on the **Start** button, point to **Programs**, select **Acer Server Management Suite** then click **ASM Console**.

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Appendix C: Rack installation guide

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This appendix shows you how to convert your Altos G300 series server from a stand-alone tower to a rack-mounted system.

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System rack installation

Aside from its tower configuration, the Altos G301 server system can also be mounted in a rack-model position. A rack mount kit is available for customers who want to convert a tower-mounted system to rack-model design. To purchase a rack mount kit, contact your local Acer representative.

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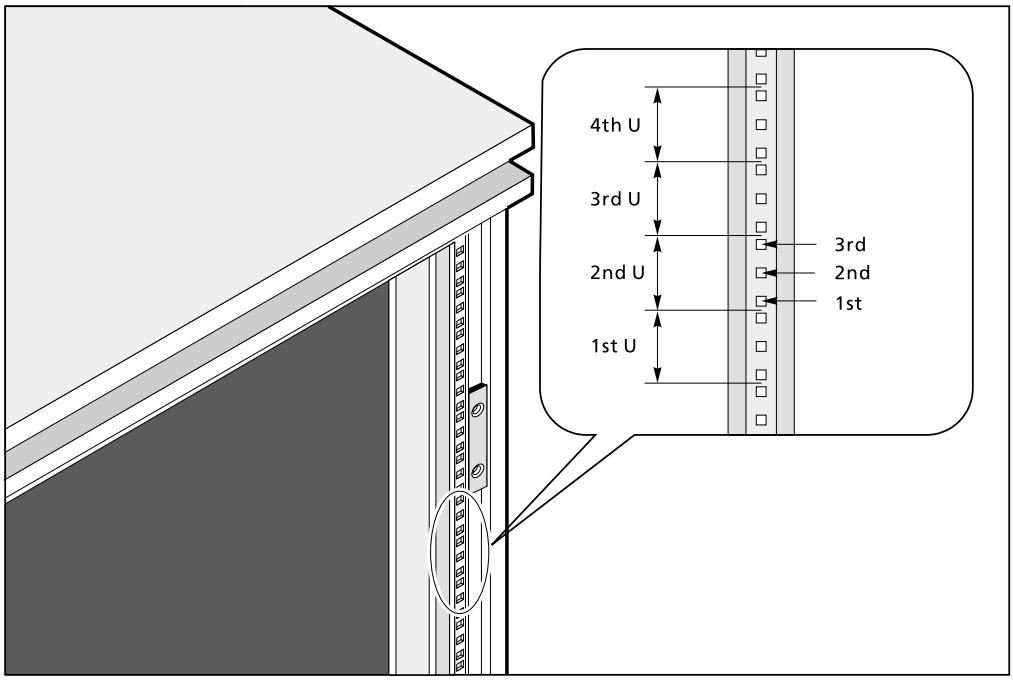
Vertical mounting hole pattern

The four vertical rails of a rack contain mounting holes arranged in a manner shown in the figure below:



The system occupies 6U in the rack. Count the U positions and hole numbers from the bottom up.

Note: The unit of measurement used in this document is "U" (1U = 1.75 inches or 44.45 mm). The total sum of the heights of all components in the rack measured in "U" cannot exceed the height of the rack. For more information, refer to the documentation that came with your system rack.

The distance from the center of two holes with closer spacing to the center of the next pair is equivalent to 1U.

When installing components, you must start your measurement from the center of the two holes with closer spacing. Otherwise, the screw holes on the component may not match those on the rack.

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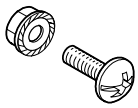
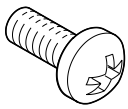
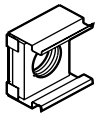
Screw types for rack installation

The following screws are used in the assembly of the Acer Altos G301 and other rack-mountable components.

	Screw type	Figure	Usage
1	#8-32 x 0.25 inch		Securing the inner mounting rails to the server tray
2	Hex head #6-32 0.25 inch		Attaching the side handles to the server
3	M4 x L8 M4 nut		Securing the mounting brackets to the inner sliding piece
4	M6 x L10		Securing the cable carrier and the mounting rails to the rack
	Cage nut		Supports the M6 metal screws for securing server components to the rack

Installing cage nuts

Cage nuts are use to secure systems and other components to the vertical rails in the rack.

To install cage nuts:

1 Insert the lower lip of the cage nut over the bottom of the opening at the back of a rail.

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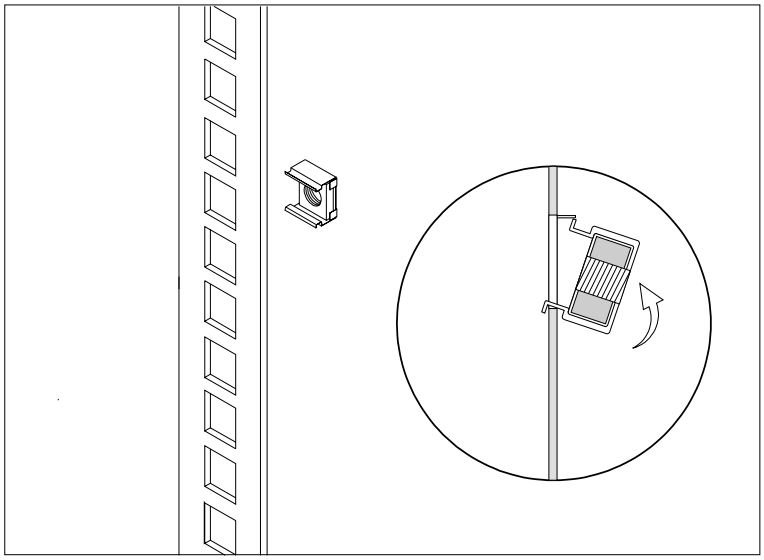
2 Pinch the cage nut lips with your fingers and press until it locks into place.



3 Repeat this process to install the other cage nuts in their appropriate locations.

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Installing the system into the rack

To install the system into the rack:

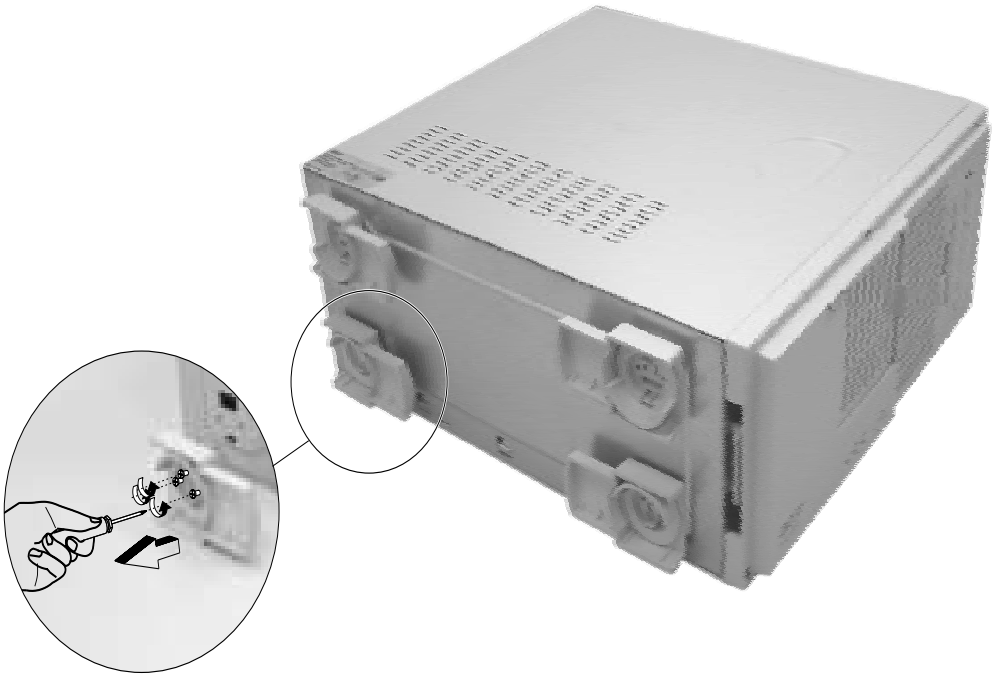
1 Remove the front panel from the server. Refer to “Removing the front panel” on page 33 for instructions.

2 Remove the foot stands from the server.

(1) Lay the server on its side on a flat, stable surface.

(2) Remove both of the screws from the center of each of the server’s four foot stands. Keep the stands and screws for later use.

3 Slide the stands inward, and remove them one by one.



The Altos G300 Rack mount kit contains two sets of rack brackets and mounting rails. The rack brackets attach to the mounting rails to the server tray. Each bracket is composed of three pieces: a detachable inner rail and a fixed middle and outer rails. The mounting rails allow the system to slide in and out of the rack mount for maintenance purposes.

4 Remove the inner rail from the rack brackets.

(1) Extend the inner rail until the rail release latch clicks.

(2) Hold down the latch then slip the inner rail out.

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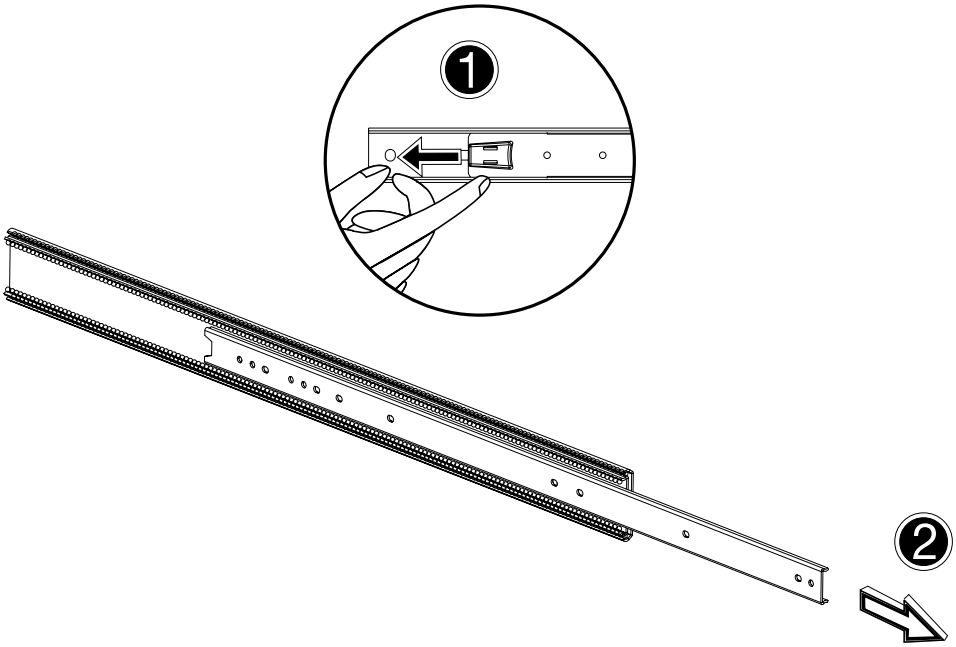
Do the same thing with the other rack bracket.



5 Attach the inner rails to both sides of the server tray.

(1) Align the inner rail to the screw holes located on either side of the server tray.

(2) Secure the two rails to the server using #8-32 x 0.25 inch screws.

Attach the other inner rail to other side of the server tray.

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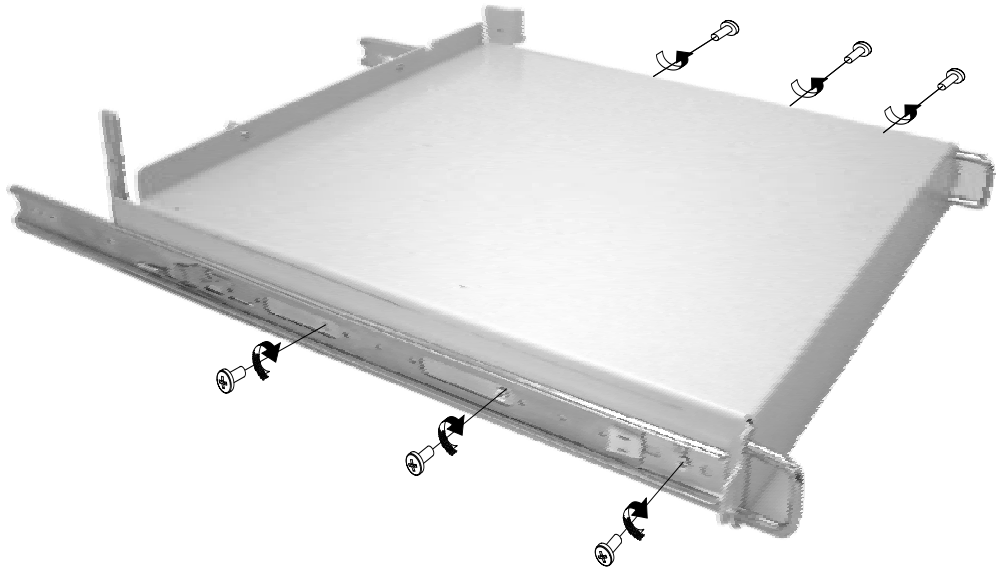
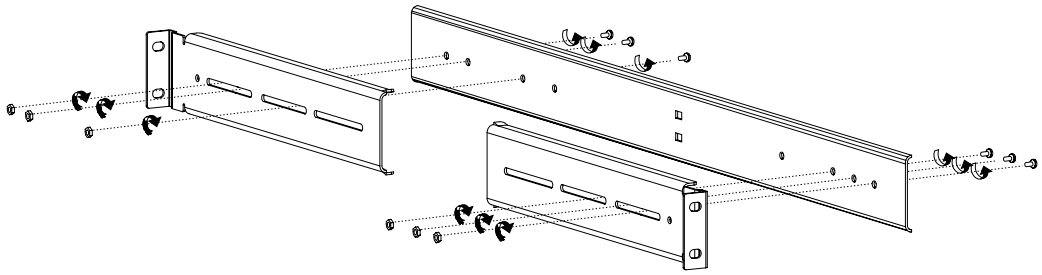


6 Set the server tray aside.

7 Attach the rack brackets to the mounting rails.

- Align the rack brackets to the mounting rail until the six screw holes become visible.
- Secure the rack bracket to the mounting rail using M4 x L8 screws. Tighten the screws, but leave them loose enough to allow length adjustment when installing the mounting rails to the rack.

Attach the other rack brackets to the remaining mounting rail.



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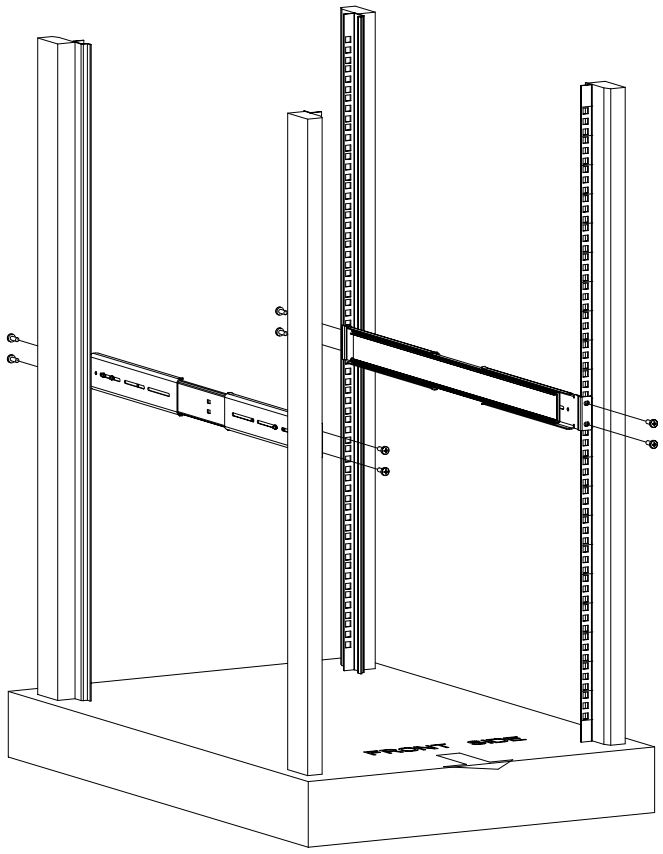
8 Install the mounting rails to the rack using four M6 x L10 screws for each mounting rail.



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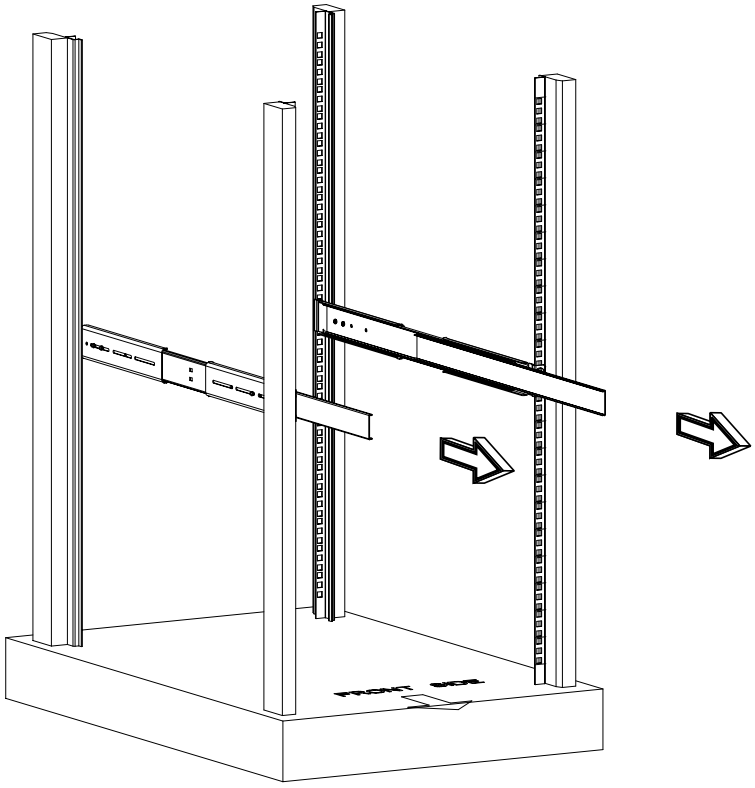
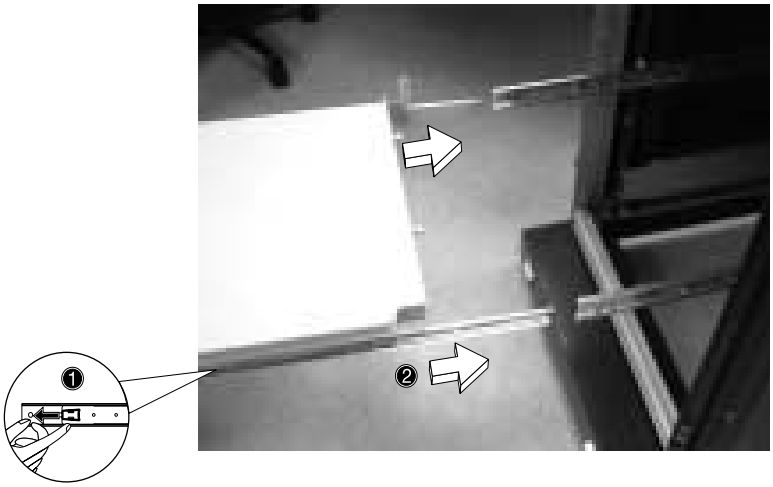
9 Extend the middle sliding piece of each mounting rail forward until it clicks.



10 Install the server tray into the rack by first carefully aligning the inner rails attached to the tray with the mounting rails on the rack.

(1) Press the release latch on both sides of the server tray.

(2) Slide the server tray into the rack then push the tray into the rack until it clicks.



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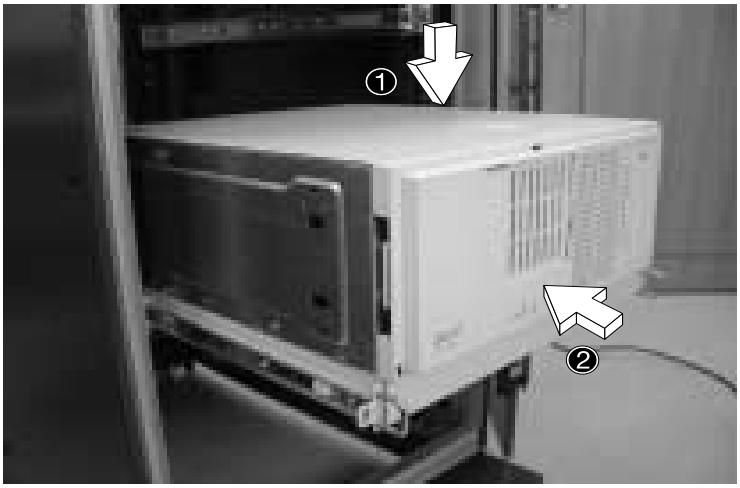
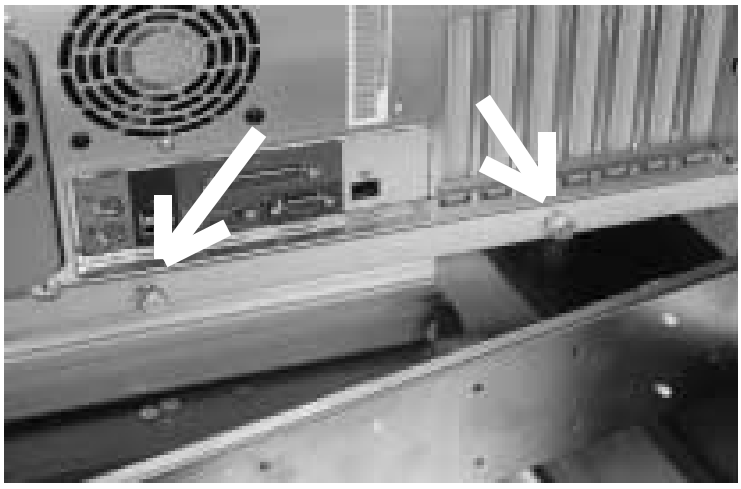
11 Turn the Altos G301 on its side.

(1) Place the system on the server tray.

(2) Push the server to the back of the tray so it can be secured to the tray.



12 Secure the server to the back of the server tray using the two attached screws. To access this location, you may need to open the back door of the rack.



Caution! To avoid personal injury, care should be taken when pressing the component rail release latches and sliding the component into the rack.

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13 Attach the Cable Arm

The optional Cable Arm keeps peripheral and power cables from becoming tangled or severed when the system slides in or out.

(1) Attach the cable arm to the back of the server with two screws.

(2) Install two cage nuts in the rail to which the cable arm is to be attached. Extend the cable arm enough to attach it to the rail using two M6 x L10 screws.

(3) Insert the power, peripheral and networking cables into the appropriate ports. Refer to Chapter 2 for detailed instructions.

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(4) Bundle all cables to the cable carrier with the cable clamps.

The cable arm will protect the cables when the system is being moved into or out of the server rack.

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